Nova Scotia Health

STRENGTHENING PRIMARY*care* IN NOVA SCOTIA COMMUNITIES

Summary of Evaluation Results

September 2004

Your Health Matters

STRENGTHENING
PRIMARY**care**
IN NOVA SCOTIA COMMUNITIES

Strengtening Primary Care: Summary of Evaluation Results

STRENGTHENING
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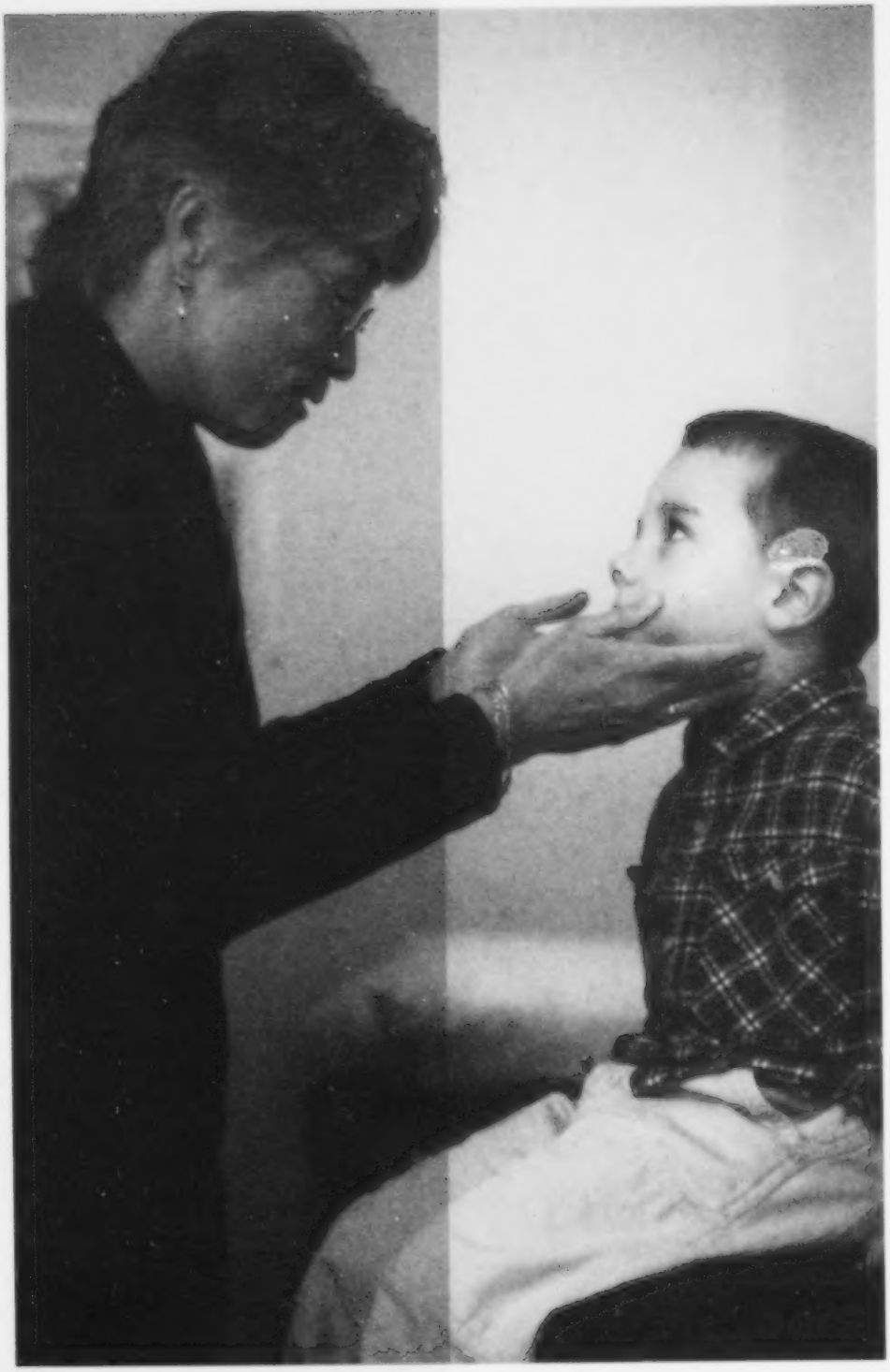
IN INNER CITY COMMUNITIES



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Acknowledgements

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STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Introduction

The purpose of the Strengthening Primary Care Initiative (SPCI) was to support primary care providers and communities who were interested in trying new ways of delivering primary care services by building on the strengths, innovation and leadership that exist within those communities. The goals of the SPCI were:

- to improve patient/client centred primary care
- to improve responsiveness of primary care organizations/groups to community needs
- to improve access to comprehensive primary care services
- to increase emphasis on health promotion and illness prevention
- to improve collaboration
- to improve accountability

To implement and evaluate the impact of changes in primary care delivery, demonstration sites were established in four different communities in Nova Scotia. In order to participate in the SPCI, each of the four sites was required to include the following three implementation strategies as part of their overall plan for change:

- hire a nurse practitioner to practice collaboratively with one or more family physicians and other members of an interdisciplinary primary care team
- adopt alternative payment mechanisms for primary care physicians
- adopt and use computerized information systems to support primary care service delivery

This report presents an overview of the major evaluation findings from the Initiative. Drawing from the entire set of evaluation results, the purpose of the synthesis is to highlight significant lessons that were learned about implementing the various change strategies used in the SPCI and to provide details about the extent to which the SPCI achieved its goals and objectives.

Achievement of Goals and Objectives

To improve patient/client centered primary care

Overall, the SPCI improved some important aspects of patient/client-centered care. The addition of the nurse practitioner expanded the choice of provider for patients. Patients readily accepted and were satisfied with the quality of care and services provided by the nurse practitioners and the clinic. The information system improved the readability and completeness of patient records. It also increased the ease with which patient information could be accessed and did not interfere with patient-provider relationships. Most importantly, the evaluation showed that the overall process and quality of primary health care was either maintained or improved during the Initiative.

To improve responsiveness of primary care organizations/groups to community needs

The SPCI was successful in improving the responsiveness of primary care organizations/groups to community needs. This was achieved in large part through the inclusion of community representatives in the governance and advisory structures of the sites, as well as the addition of providers who had a portion of their time allocated to community-based work. Overall, patients were satisfied with the range of services provided by the demonstration sites.

To improve access to comprehensive primary care services

The SPCI achieved a major objective in providing access to an interdisciplinary team that included a family physician and nurse practitioner practicing collaboratively. In general, the SPCI does not appear to have affected patient access to urgent care. There was no change in where patients first seek their care, and no change in patient perception about availability of services outside of normal clinic hours. Access for some traditionally under-serviced groups was addressed with implementation of site-specific strategies to reduce barriers and respond to needs. The addition of the nurse practitioner is believed to enhanced access for under-serviced groups.

To increase emphasis on health promotion and illness prevention

All sites reported an increased emphasis on health promotion and illness prevention, primarily through the work of the nurse practitioner both in the clinic and the community. Computerized alerts were somewhat effective in increasing health promotion-related counseling. An extended implementation time period may have allowed for increased uptake of the patient recall software feature, possibly enhancing further health promotion and disease prevention activities.

To improve collaboration

The SPCI appears to have improved and strengthened collaboration among participating primary care providers. It has also enhanced collaboration between demonstration sites and other health care providers in the community. The involvement of the Department of Health and providers' professional associations were important supports in the establishment of collaborative practices.

To improve accountability

Accountability has improved at many levels, provincially through the development of legislation to support the practice of nurse practitioners, in local communities through the participation, planning, implementing and evaluation of the SPCI and in primary care organizations through the establishment of formal collaborative practice agreements and providing high quality data for the evaluation of the SPCI.

Lessons Learned

Introducing Nurse Practitioners in Collaborative Practice

Most participants saw the implementation of the nurse practitioner in collaborative practice with a family physician as a major benefit of the SPCI, and the nurse practitioner was seen to positively impact on most of the goals of the Initiative.

- It takes time to integrate the nurse practitioner role into an existing primary care practice. Efforts must be made to differentiate the role of the nurse practitioner from existing providers, and time must be spent educating providers, staff, patients and the community about the role of the nurse practitioner.
- The role that nurse practitioners play in community-based health promotion is vital, yet the time required for community programming competes with nurse practitioner's time spent in clinical practice. In order for community programming to occur, sufficient time in the nurse practitioner's schedule must be protected for the necessary planning and implementation of these activities.
- Developing collaborative practice relationships takes time, effort, and support from external bodies. The support provided by the Department of Health and providers' regulatory bodies was essential in the development of collaborative practices within the SPCI.

Introducing Information Systems

At the end of the initiative 85% of providers continued to use the clinical software. The information system improved the readability of patient records and increased the ease with which patient information could be accessed. The process of electronic charting and the perceived complexities, deficiencies and unfriendliness of the software required adaptation and lengthened charting time for most providers resulting in some negative impacts on workload.

- Implementing an EPR is a considerable undertaking for primary care clinics. The initial investment of effort and time required to install systems, train users, convert data and develop user familiarity is very large and must not be under-estimated. There may potentially be provider workload impacts.
- Sufficient time must be given when selecting electronic patient record software systems to ensure that a thorough hands-on review is conducted.
- Billing applications should be provincially accredited and thoroughly reviewed as part of the vendor evaluation.
- On-line access to laboratory and diagnostic imaging reports is an essential component of an electronic patient record system.
- Clinics considering implementing EPRs are strongly encouraged to ensure that all providers at the clinic agree to chart their visits using the EPR software.
- Use of the EPR in the patient's presence maximizes the potential benefits (e.g. electronic prescribing) that can be derived from the system. Providers require access to the EPR from within their examination rooms.
- To ensure good quality data: providers need to be involved in identifying indicators that are relevant to their patient population.
- An increased clinical perspective in training and ongoing support for providers is critical in ensuring the Information Systems is used to its full potential.

Introducing the SPCI

The SPCI simultaneously implemented a new primary care provider and collaborative practice environment, an advanced information system, a new payment mechanism (in one site) and a comprehensive evaluation. The magnitude of change was enormous, and required a high level of commitment and support from communities, providers, and government.

- Primary care organizations and their communities require support to build on existing strengths and increase their capacity to implement new ways of organizing, delivering and funding primary care services.
- Managing this type of change is critical. It requires ongoing planning and commitment by a wide range of champions, including communities, providers, stakeholders and government.
- Changes to the way primary care is delivered should be made gradually to allow providers to continue to provide care while changing the way that they deliver care.
- A longer transition between the planning and implementation stages would have benefited the demonstration sites.
- A two-year demonstration period is not long enough to effectively evaluate all of the goals and objectives established for the SPCI.
- Communication is key to supporting demonstration projects, and therefore an effective communication plan must be developed and implemented with adequate resources.
- Evaluating changes in primary care delivery is a complex and time consuming process that requires adequate and consistent resources in order to be successful.

Introduction

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In 1997, the federal government created the Health Transition Fund (HTF) to generate evidence about effective models and approaches to four priority areas of health care: home care, pharmacare, integrated service delivery, and primary care. The majority of the per capita allocation of HTF funds in Nova Scotia was committed to evaluating new ways of delivering, managing, and funding primary care services. In April 1998, the Nova Scotia Department of Health allocated $2.85 million of the HTF Fund to a primary care demonstration project called the Strengthening Primary Care Initiative (SPCI). After a planning phase that involved many stakeholders throughout 1998 and 1999, the Initiative officially launched study sites for a period of two years, extending from January 2000 to December 2002.

Purpose of the Initiative

The purpose of the Strengthening Primary Care Initiative (SPCI) was to support primary care providers and communities who were interested in trying new ways of delivering primary care services by building on the strengths, innovation and leadership that exist within those communities. To implement and evaluate the impact of changes in primary care delivery, demonstration sites were established in four different communities in Nova Scotia. The demonstration sites were planned and implemented by health care providers and community representatives from each of the four communities to ensure that changes were implemented in ways that best met the needs of the communities involved.

Goals

The goals of the Initiative were:

To improve patient/client centered primary care.

To improve responsiveness of primary care organizations/groups to community needs.

To improve access to comprehensive primary care services.

To increase emphasis on health promotion and illness prevention.

To improve collaboration.

To improve accountability.

The specific objectives of the Initiative can be found in Appendix A.

STRENGTHENING PRIMARY Care IN NOVA SCOTIA COMMUNITIES

The SPCI Steering Committee and Working Groups

A provincial Steering Committee provided leadership for the development of the SPCI. The Steering Committee's mandate was to provide ongoing policy and practical advice for the development and implementation of the Initiative. The following organizations were represented on the Steering Committee:

- medical, nursing, and allied health professions
- former regional health boards
- tertiary care facilities
- community health boards
- community health centres

Three working groups were created to support the work of the Steering Committee, including working groups on Evaluation, Information Systems, and Funding Formulae and Policy. Many different organizations participated on the various working groups, including representatives from the demonstration sites.

The Demonstration Sites

Demonstration sites were selected by the Steering Committee using a two-stage process. The first stage was a call for letters of intent. From 17 letters received, eight proponents were invited to submit proposals. With input from the three working groups, the Steering Committee selected four proposals that were believed to best reflect the goals and objectives of the SPCI, resulting in the following four communities/organizations being invited to establish demonstration sites:

- North Queens Community Health Centre in Caledonia, Queens County
- North End Community Health Centre in Halifax
- Springhill & Area Healthy Community Society in Springhill
- Healthy Pictou West in Pictou West

In order to participate in the SPCI, each of the four sites was required to include the following three implementation strategies as part of their overall plan for change:

- hire a nurse practitioner to practice collaboratively with one or more family physicians and other members of an interdisciplinary primary care team
- adopt alternative payment mechanisms for primary care physicians
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Project Stages

The Planning Stage

The Steering Committee, working groups, Department of Health staff, and health providers and community volunteers from each demonstration site, invested considerable effort in the planning stage to prepare for the implementation of the SPCI. Issues and challenges that were addressed in this stage of the SPCI included:

- finalizing a definition of primary care and the goals and objectives of the SPCI
- establishing criteria for selecting demonstration sites
- developing an evaluation framework

- identifying information systems requirements and one vendor to supply systems to all four sites
- planning and providing ongoing training and technical support for the information systems at each site
- developing "Guidelines for Nurse Practitioners in Collaborative Practice in Primary Care Demonstration Projects" to enable nurse practitioners to practice in Nova Scotia
- developing procedures to protect the privacy of personal health information
- amending the Pharmacy Act and supporting regulations to enable pharmacists to fill prescriptions written by nurse practitioners
- implementing various recruiting strategies when it became apparent that finding nurse practitioners to participate in the demonstration sites was a significant challenge

The Implementation Stage

Over the two-year demonstration period, many changes, both intended and unanticipated, took place at each of the four sites. Changes that were successfully implemented included: implementation of a collaborative practice team, which involved hiring a nurse practitioner, developing and implementing a formal collaborative practice agreement between the nurse practitioner and the physician(s), and developing a working relationship among the team members to provide optimal primary care to patients at each site.

Implementation of an information system (IS) consisting of a clinical software application, practice management software, hardware and software support. The clinical software featured an electronic patient record (EPR). System implementation included system installation, staff training, data entry and integration of system use in the day-to-day activities of each site.

Implementation of new organizational and governance structures took place at some of the sites.

Although the SPCI was originally intended to test different models of funding, such as population-based funding, physicians in all but one of the selected sites already had alternative payment contracts with the Department of Health, which were continued unaltered. Department staff worked with the physician at the remaining site to develop a payment contract.

Project management and administrative support was a major aspect of the SPCI, necessary to support the large amount of change being introduced at the sites. Some of the essential project management and administrative tasks completed successfully to support the SPCI included:

- development of legal contracts between the Department of Health and the study sites
- hiring of administrative support people by each demonstration site
- development and implementation of a communication plan to guide regular communication among the Department of Health, demonstration sites and the public
- hired one half-time resource specifically for Information Systems

The Evaluation Working Group (EWG), external evaluators and Department of Health staff developed an evaluation framework that included a program logic model and two measurement matrices.

The evaluation framework was developed based on the goals of the Health Transition Fund, the goals and objectives of the SPCI and evidence-based outcomes. It includes the implementation strategies of the SPCI, the implementation objectives of these strategies, as well as outputs and outcomes. Both process and impact measurement matrices were developed from the program logic model, which provided the performance measurement approach for evaluating the SPCI. The matrices included the key evaluation questions, indicators and data collection methods. The demonstration sites had an important role in guiding the final evaluation approach, including identifying methods that were appropriate for use in their communities.

Evaluation Methods

A mixed method approach was used to collect the evaluation data, including the following methods that were completed both near the beginning and end of the demonstration period:

- focus groups with health providers, patients and community representatives
- a patient telephone survey with patients at three of the demonstration sites (one site elected not to participate in this data collection method)
- interviews with health providers and administrative staff at the sites
- a chart audit to determine the impact of the changes at the sites on the quality of care related to diabetes and hypertension
- information systems surveys with providers and support staff

Other methods used to collect data included:

- quarterly reports completed by the sites during the demonstration period
- site observations
- analysis of data from the clinical and practice management components of the information systems
- IS telephone surveys

A brief description of each evaluation method is included in Appendix B. Detailed technical information about the evaluation framework and data collection methods is available by contacting the Primary Health Care Section, Nova Scotia Department of Health.

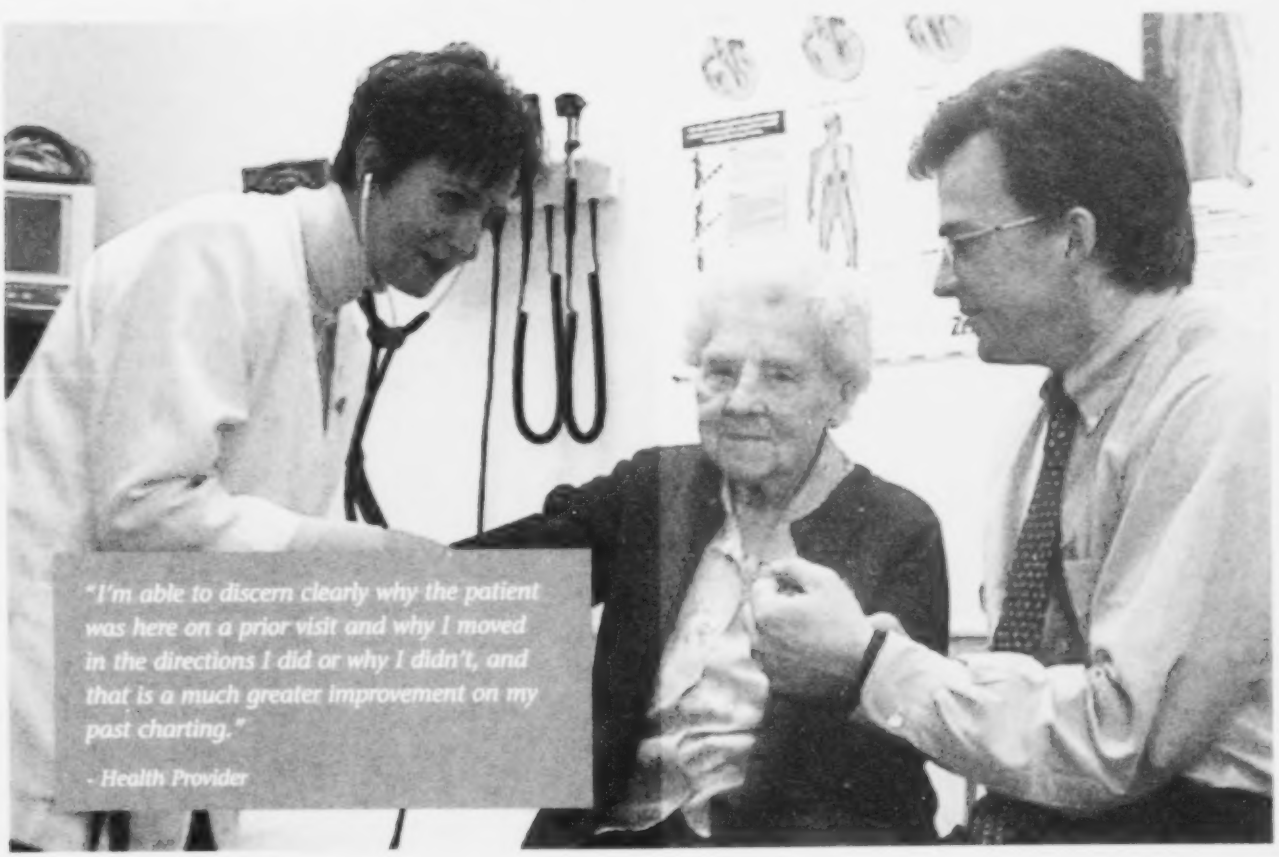
External evaluators collected the data for focus groups, site interviews, patient surveys and chart audits. Other sources of data were collected by Department of Health staff. Research protocols were approved by the Dalhousie University Health Sciences Human Research Ethics Board.

Key Findings

Goal 1: Improving Patient/Client Centred Primary Care

Related to the goal of improving patient/client centred primary care, the SPCI was intended to achieve the following objectives:

- individuals maintain the right to choose their principal primary care providers
- individuals, families and providers are supported in making informed decisions
- care is coordinated and integrated to ensure seamless access for the individual and family in the optimal setting
- care and service are based on the individual's and family's health care needs
- ongoing and respectful relationships among individuals, families and providers are fostered
- individuals and families receive quality care from competent, responsible, providers in a timely manner


"I'm able to discern clearly why the patient was here on a prior visit and why I moved in the directions I did or why I didn't, and that is a much greater improvement on my past charting."
- Health Provider

Key Findings

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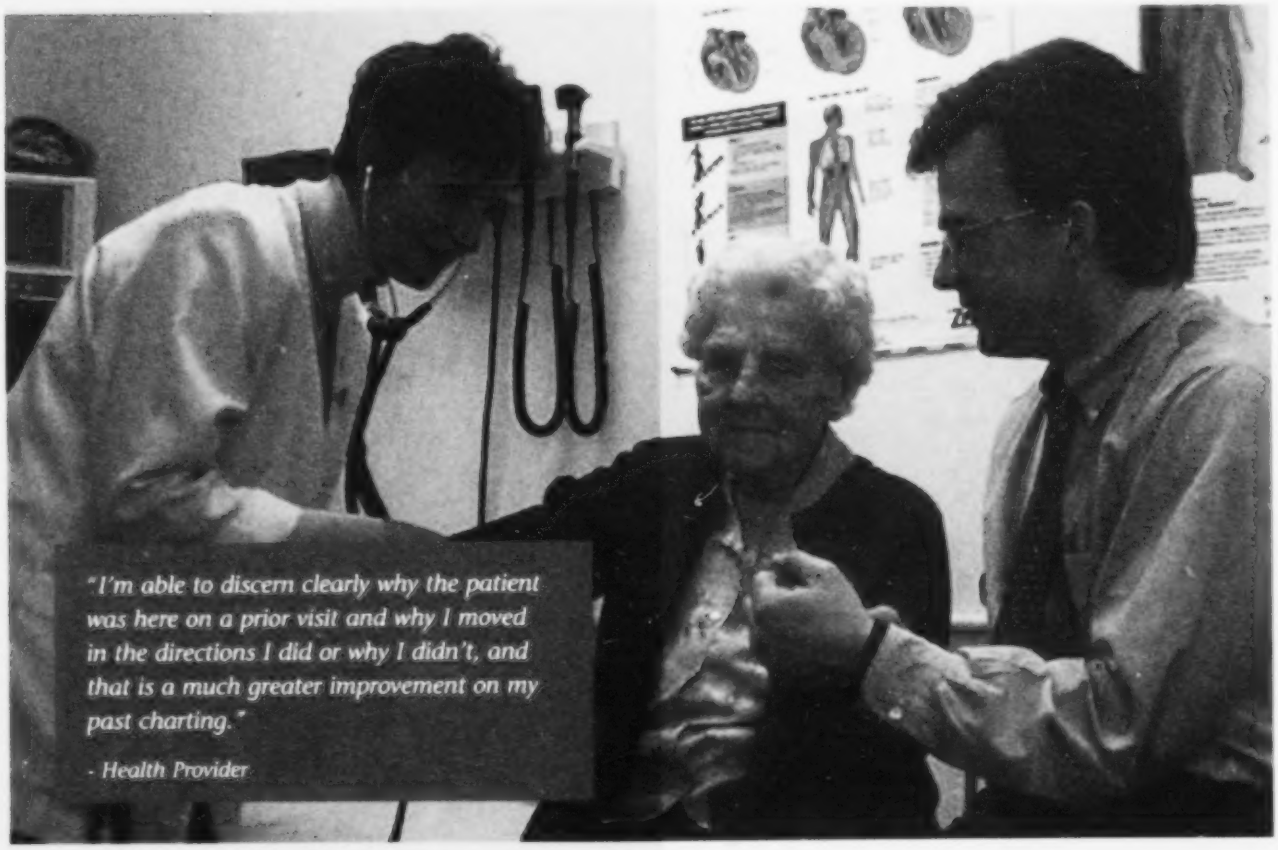

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- Health Provider

Progress Toward The Goal

Choice of Provider

For many patients, the addition of the nurse practitioner offered for the first time the opportunity to choose between different types of primary care providers. Seventy-two percent of patients surveyed at the end of the demonstration period said they were aware of the choice of provider available to them. Many patients did in fact choose a different provider. The patient survey results indicate that by the end of the project about 30% of patients had switched from seeing a doctor alone at a visit to seeing a nurse practitioner singly or in addition to the doctor ($p>0.001$).

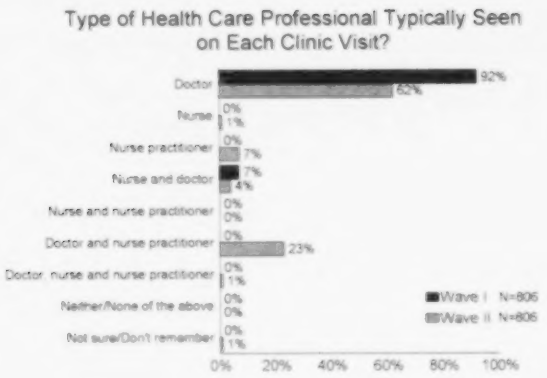
Support for Individual, Family and Provider Decision-Making

The majority of patients (72%) who had to make a difficult decision regarding health care rated the support they received from their health care providers as excellent or very good. This remained consistent throughout the study period.

An information system can offer providers several tools to aid in decision-making. For some providers, having an electronic patient record (EPR) offered benefits in accessing and retrieving useful patient information. Information for decision-making was readily available without having to look for a paper chart. In addition, some providers liked the concise, chronological presentation of clinical information that facilitated care and convenient access to patient information during telephone consultations.

Most providers found that the clarity and completeness of documentation improved using the electronic patient record. Clarity of documentation improved for 88% of providers with legibility offered as the main reason. Although the completeness of documentation improved for 67%, the overall gain was small.

The lack of on-line access to laboratory and other diagnostic results was identified by many providers



as a major deficiency. Development of this software feature was not included in this Initiative. This prevented full realization of the software's potential benefits in providing information for decision-making.

Coordinated and Integrated Care

Patients who participated in the patient surveys were asked about the characteristics of care when referrals to specialists or specialty services are required. Survey results indicate that the SPCI did not appear to change patients' experiences of care coordination between their primary care provider and specialists.

Other health providers believe that coordination of care improved with the addition of the nurse practitioner. Focus group participants reported that referral patients receive more consistent follow-up and that increased consultation between other healthcare providers and the clinics through the nurse practitioner has positively impacted integration of care.

The information system was also seen as helpful in increasing the coordination of care by facilitating the exchange of patient information among providers

"Just simple things like taking blood pressures, requisitions for seeing somebody for a urine analysis, home-visits...all of thesse things may not have taken place before the initiative."

- Health Provider

Fostering Ongoing Relationships

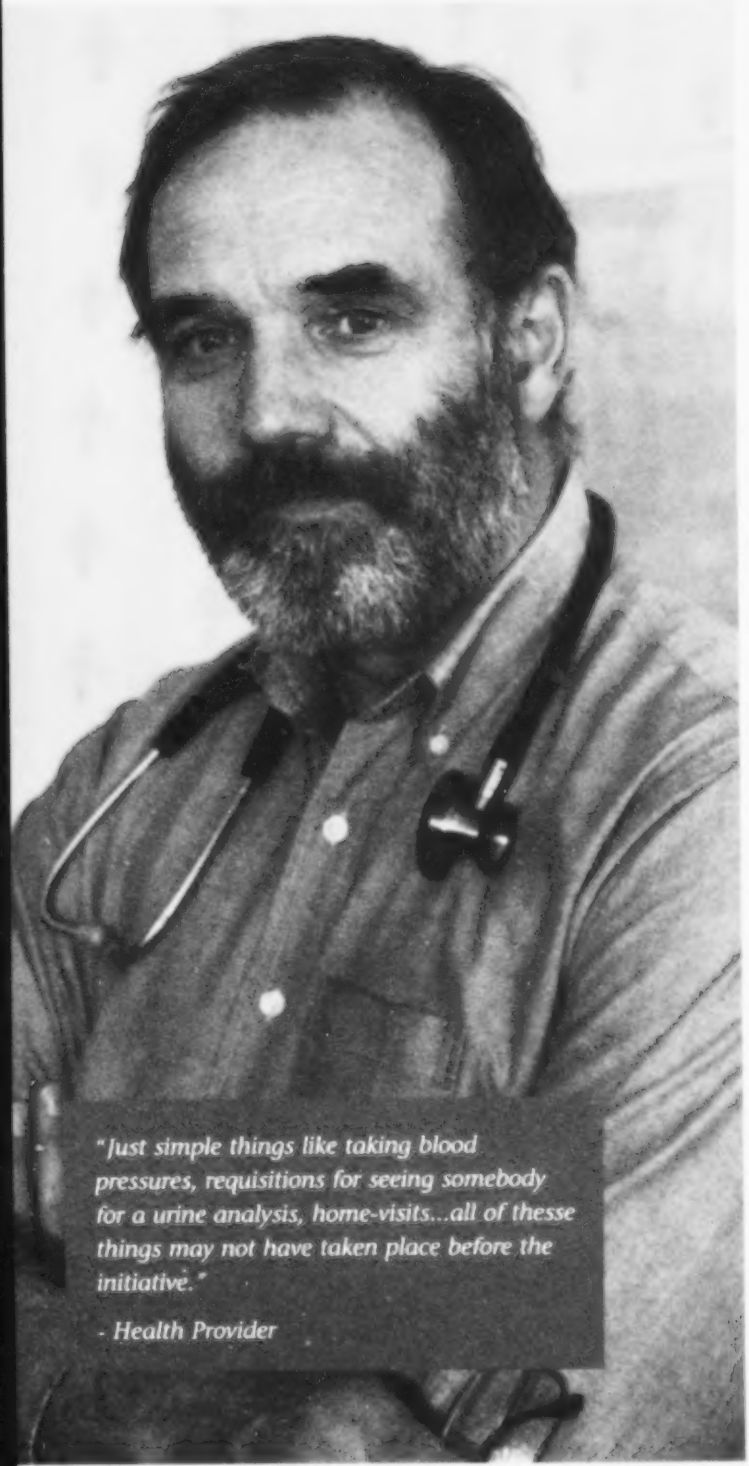
At the end of the demonstration period, over one half of the patients surveyed reported that the respect given to them by their clinic was excellent, while one third rated it as very good. This represents a small but significant increase from the first survey ($p<0.05$).

The patient survey measured how closely patients are affiliated with their primary care provider by asking questions about their usual source of care, the place most responsible for their care and the clinic that knows them best. Results from the patient surveys concerning the strength of patient affiliation with their primary care clinic increased significantly from 3.4 to 3.6 (scale maximum is 4) over the demonstration period ($p<0.005$).

Prior to implementation, there was concern that computers might interfere with provider-patient relationships. Patient feedback indicated that there has been little impact. The vast majority (95%) of patients whose health care providers use computers during their visits are comfortable with the practice. Interview data suggests that some providers may have minimized possible negative impacts of the information system on patient rapport by consciously avoiding viewing the monitor while interacting with the patient or by charting after the encounter.

Quality of Care

At the end of the SPCI, close to seven in ten patients were very satisfied with their clinic's quality of care. Importantly, the proportion of patients indicating that they were very satisfied with the quality of care increased significantly over the demonstration period from 62% to 68% ($p<0.05$). Patients were also asked about the change in quality of services over the course of the project. Six in ten patients indicated that the delivery of health care at their clinic improved. Health care providers at one site noted that the SPCI enabled providers to spend additional time with their patients, which in turn has made a significant difference in how care is delivered. Attitudes were positive regarding the quality of services provided by the nurse practitioner at their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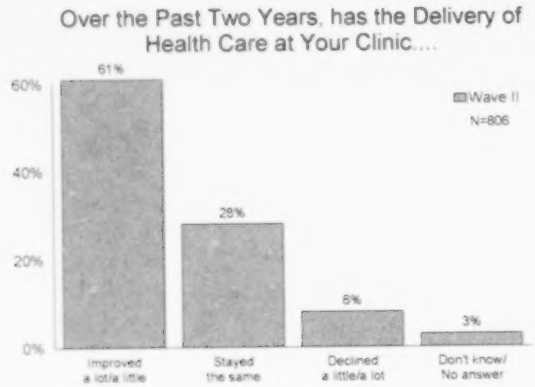
clinic. Eight in ten patients surveyed at the end of the project were very (52%) or generally (27%) satisfied with the quality of services provided by the nurse practitioner. Patients participating in focus groups indicated that they were very comfortable visiting the nurse practitioner and had confidence in her ability to provide high quality care.

Chart audit results indicate that overall patient care related to diabetes and hypertension was either maintained or improved throughout the demonstration period. The diabetes chart audit showed that by the end of the project there were higher proportions of patients with satisfactory blood pressure control, receiving annual screening for nephropathy and retinopathy and performing home blood glucose monitoring than before the SPCI.

The hypertension chart audits (Table 1) revealed that the proportion of patients who had their blood pressure checked at least twice a year decreased, however, the proportion of patients who achieved target systolic and diastolic blood pressure readings increased over the course of the project.

The information system appeared to have minimal impact on quality of care. A few providers reported that the electronic patient record templates improved their charting skills as well as their ability to assess patient histories, provide comprehensive physical examinations and give follow-up care.



Summary

Overall, the SPCI improved some important aspects of patient/client-centered care. Patients readily accepted and were satisfied with the quality of services provided by the nurse practitioners and the clinics. The addition of the nurse practitioner enabled a greater choice of providers for patients and reduced the patient load for all providers, which resulted in less stress for providers and more time for patients.

The information system provided some benefits in decision-making support, coordination of care and evaluation. The information system improved the readability and completeness of patient records. It also increased the ease with which patient information could be accessed and did not interfere with patient-provider relationships. The ability to extract clinical data provided useful information for evaluation purposes.

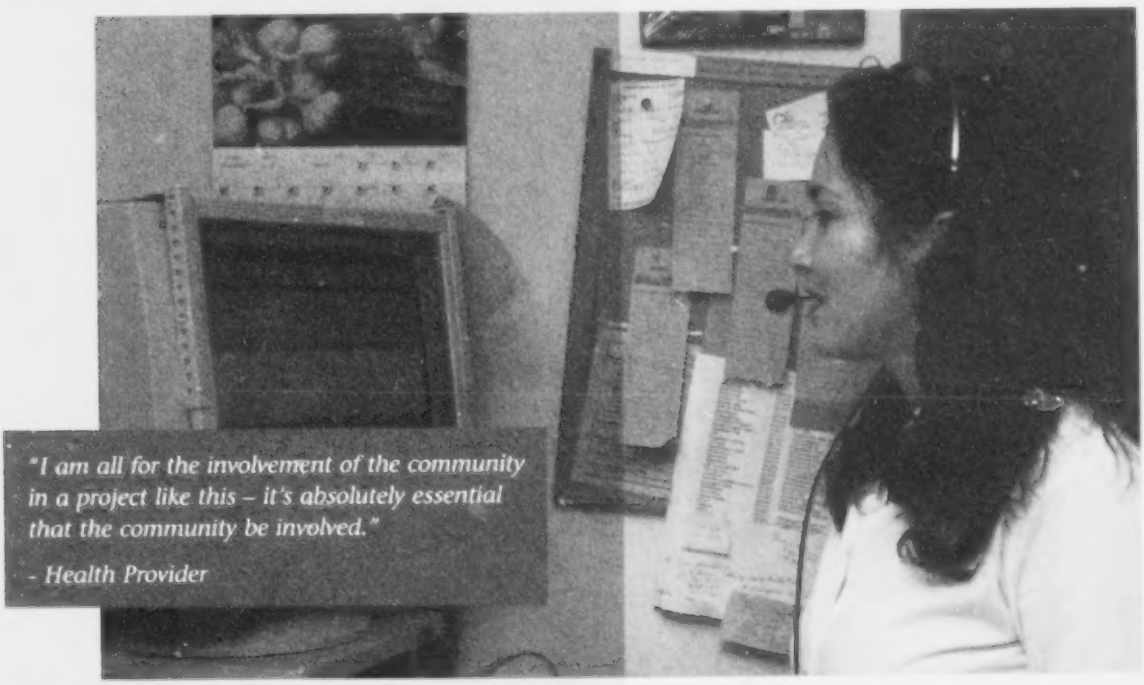
Table 1: Diabetes Quality of Care Indicators Showing Improvement

	Before SPCI	After SCPI	P Value
Proportion of diabetic patients with satisfactory blood pressure control (<130/80))	20.4%	28.5%	<0.01
Proportion of diabetic patients who had annual screening for retinopathy	33.8%	41.9%	<0.05
Proportion of diabetic patients who had annual screening for nephropathy	61.7%	71.3%	<0.05
Proportion of diabetic patients who were home glucose monitoring	61.5%	69.1%	<0.01

Goal 2: Improving Responsiveness of Primary Care Organizations/Groups to Community Needs

Related to the goal of improving responsiveness of primary care organizations/groups to community needs, the SPCI was intended to achieve the following objectives:

- communities are encouraged to participate in partnership with the primary care organizations/groups and with others in finding solutions and ways of re-designing the delivery of primary care services
- primary care organization/group governance and/or advisory structures involve community representation
- primary care organizations/groups understand their various communities (including city/town/village distribution, people with special needs resulting from physical, mental, cultural, socio-economic or other factors), and are responsive to clearly defined community health needs
- primary care organizations/groups develop partnerships with under-serviced groups within the population (including cultural and minority groups) to implement strategies to meet their primary care needs
- the scope of services will take into account local population requirements, geographic location, and the availability of other services and resources



"I am all for the involvement of the community in a project like this – it's absolutely essential that the community be involved."

- Health Provider

Progress Toward the Goal

Community Participation and Representation

Many administrators and providers believe that the role of local communities in developing the SPCI was central to its success. Community volunteers were involved in various aspects of the Initiative, from participating in the governance or advisory structures for each of the sites, to providing support for specific services such as Well Women's Clinics. Many volunteers who were involved in SPCI said that participation, while demanding and time consuming, has been one of their most rewarding experiences as volunteers.

Responsive to Local Community Needs

A number of community representatives reported through the focus groups that the SPCI was instrumental in allowing them to meet many of the community needs that had long been identified as needing attention. The nurse practitioner (and the nutritionist and foot care specialist that were also added at one site) were cited as particularly significant in allowing sites to respond better to community needs, such as home visits to seniors, diabetic care, nutritional counseling, counseling for adolescents, and enhanced preventive services for women (e.g. Pap smears and education about osteoporosis and menopause). The protected time that Nurse Practitioners and other providers had to address these issues appear to have enabled the sites to expand their abilities to respond to community needs.

An important observation made by all sites about community work is that a considerable amount of time is required to plan, develop and implement community programs. The demands of clinical practice frequently compete with the time required for community programming, so it is essential that providers in primary care sites have protected time for both clinical and community work.

"In the beginning, those involved in organizing the project were really gung ho, but this has really petered out over time. Maybe it's not as exciting as it was at first – but those who have remained have stabilized it. I have been one of them because I knew the potential, I knew that we were on the cutting edge."

- Volunteer

"Well women clinics used to be offered in the past but had gone by the wayside and I think that's a valuable service to the community. And its available at least monthly to all the women in the county, not just the practice."

- Health Provider

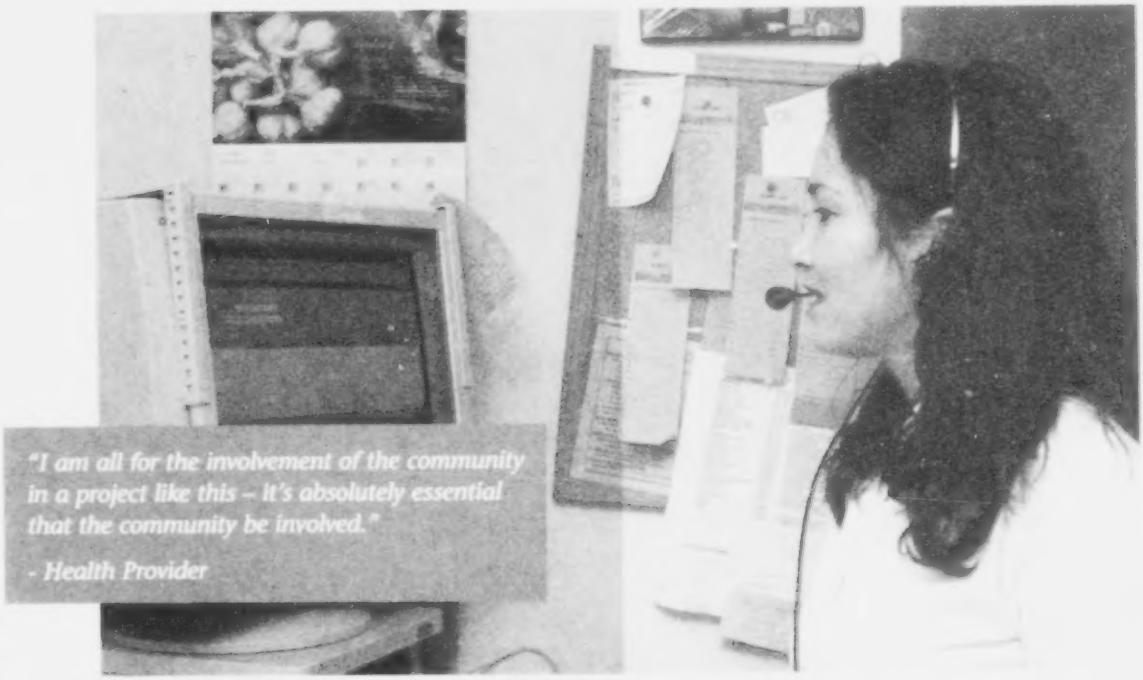
Feedback from all of the sites during the focus groups indicates that nurse practitioners have been able to enhance the sites' abilities to respond to community needs, both by responding to needs that have already been identified through health assessments prior to the SPCI and in undertaking their own needs assessments such as through self-initiated visits to community organizations. One site suggested that the presence of a female provider has been important to meeting the needs of women of all ages.

PRIMARYcare

Goal 2: Improving Responsiveness of Primary Care Organizations/Groups to Community Needs

Related to the goal of improving responsiveness of primary care organizations/groups to community needs, the SPCI was intended to achieve the following objectives:

- communities are encouraged to participate in partnership with the primary care organizations/groups and with others in finding solutions and ways of re-designing the delivery of primary care services
- primary care organization/group governance and/or advisory structures involve community representation
- primary care organizations/groups understand their various communities (including city/town/village distribution, people with special needs resulting from physical, mental, cultural, socio-economic or other factors), and are responsive to clearly defined community health needs
- primary care organizations/groups develop partnerships with under-serviced groups within the population (including cultural and minority groups) to implement strategies to meet their primary care needs
- the scope of services will take into account local population requirements, geographic location, and the availability of other services and resources



"I am all for the involvement of the community in a project like this – it's absolutely essential that the community be involved."

- Health Provider

Progress Toward the Goal

Community Participation and Representation

Many administrators and providers believe that the role of local communities in developing the SPCI was central to its success. Community volunteers were involved in various aspects of the Initiative, from participating in the governance or advisory structures for each of the sites, to providing support for specific services such as Well Women's Clinics. Many volunteers who were involved in SPCI said that participation, while demanding and time consuming, has been one of their most rewarding experiences as volunteers.

Responsive to Local Community Needs

A number of community representatives reported through the focus groups that the SPCI was instrumental in allowing them to meet many of the community needs that had long been identified as needing attention. The nurse practitioner (and the nutritionist and foot care specialist that were also added at one site) were cited as particularly significant in allowing sites to respond better to community needs, such as home visits to seniors, diabetic care, nutritional counseling, counseling for adolescents, and enhanced preventive services for women (e.g. Pap smears and education about osteoporosis and menopause). The protected time that Nurse Practitioners and other providers had to address these issues appear to have enabled the sites to expand their abilities to respond to community needs.

An important observation made by all sites about community work is that a considerable amount of time is required to plan, develop and implement community programs. The demands of clinical practice frequently compete with the time required for community programming, so it is essential that providers in primary care sites have protected time for both clinical and community work.

"In the beginning, those involved in organizing the project were really gung ho, but this has really petered out over time. Maybe it's not as exciting as it was at first – but those who have remained have stabilized it. I have been one of them because I know the potential. I knew that we were on the cutting edge."

– *Volunteer*

"Well woman clinics used to be offered in the past but had gone by the wayside and I think that's a valuable service to the community. And its available at least monthly to all the women in the county, not just the practice."

– *Health Provider*

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Each site determined the most appropriate means for examining the health needs of their communities. Mechanisms used to assess community needs included:

- relying on pre-existing needs assessments and reports related to their community (e.g. community health plans created by their Community Health Board)
- participating in local health issues committees (e.g. committees related to the health issues of black women and homeless people)
- discussing current needs with community partners
- participating in research projects
- accessing data from provincial programs (e.g. Nova Scotia Gynaecological Cancer Screening Programme)

A community orientation score was developed from patient survey questions about their perception of providers' knowledge of community-related health matters. Average scores from the community orientation scale in the patient survey increased significantly over the demonstration period from 11.3 to 12.1 ($p<0.0001$). This suggests that patients perceive that their providers knew more about community health matters after the implementation of the SPCI.

Partnerships With Under-Serviced Groups

A review of the list of partnerships established with other community services and organizations (as reported in the Quarterly Reports) shows that to varying degrees, the sites developed partnerships with under-serviced groups within the population. Across the SPCI, partnerships were reported with organizations that serve low-income single parent families, homeless people, sex trade workers, people with addictions, people with legal issues, immigrants, and women in transition from abusive situations.

> *"The fact that this institution sends people, doctors and nurse practitioners out into places where we are and where we work, really makes a tremendous difference."*
>
> *- Community Representative*

Scope of Services

It was the intent of the SPCI that the sites would offer a range of services to take into account local population requirements, geographic location, and the availability of other services and resources. The patient survey assessed patients' satisfaction with the range of services offered at their clinic, and found that the vast majority of patients were very (53%) or generally (41%) satisfied with a range of services at their clinic at the end of the demonstration period.

Summary

The SPCI was successful in improving the responsiveness of primary care organizations/groups to community needs. This was achieved in large part through the inclusion of community representatives in the governance and advisory structures of the sites, as well as the addition of a nurse practitioner who has a portion of their time allocated to community-based work.

Overall, patients were satisfied with the range of services provided by the demonstration sites.

"She goes to the school and takes appointments with the students, all confidential. It has provided the young people with a chance to talk to a health care professionals where before maybe they weren't comfortable going to the . health centre where somebody might see them."

- Community Representative

"I am better able to be responsive to the needs of the community now, because a component of my role has been to go out into the community – so I now understand more than I did earlier about patient/community needs here."

- Health Provider

"It's very important that outreach programs be allowed time to grow, and clinics need to have that time built into the providers' schedule."

- Health Provider

Goal 3: Improving Access to Comprehensive Primary Care Services

Related to the goal of improving access to comprehensive primary care services, the SPCI was intended to achieve the following objectives:

- everyone served by the primary care organization/group has access to an interdisciplinary team including a family physician and a nurse practitioner practicing collaboratively
- primary care organizations/groups provide or arrange for 24-hour urgent care
- primary care organizations/groups enhance access for those who face barriers in the current system, including minority and cultural groups, mentally ill, the chronically disabled and the poor

Progress Toward the Goal

Access to Primary Health Care

A major objective of the Initiative was to provide access to an interdisciplinary team including a family physician and nurse practitioner in collaborative practice. This objective was achieved at all sites. Evaluation results indicate that patients accepted and were satisfied with their care.

Access to Urgent Care

Results from the patient survey confirm that there were no changes before and after the demonstration period in accessibility of urgent care, specifically relating to receiving same-day care, care during off-hours and access to a telephone number to call when the clinic is closed. Less than one quarter of patients surveyed reported that they would definitely or probably be seen on the weekend if the clinic was closed, and likewise there was no significant change in the number of patients who reported that they would be seen during the night when the clinic is closed. There were also no changes in the number of patients going to the emergency department without first contacting their clinic.

Ease of Access

The SPCI appeared to have little overall impact on ease of access for care at the demonstration sites. Average patient survey scores related to the ease of how care was accessed in a variety of situations did not change over the demonstration period. Access for some traditionally under-serviced groups was perceived to have improved. Focus group and site interview participants reported that nurse practitioners positively impacted access for a number of under-serviced groups including:

- women of all ages seeking well women care
- teenagers
- seniors
- persons with mental health issues
- access for Those Who Face Barriers

All of the sites implemented strategies to increase access to primary care services for those who face barriers in the current system. Examples of strategies implemented during the demonstration period and reported in the Quarterly Reports include:

- home visits for house bound seniors
- renovations to physical facilities to enhance wheelchair accessibility
- implementation of a teen advisory committee to examine the needs of the teen population who were not accessing the site
- evening clinics for non-emergency appointments
- well Women's Clinics offered at varying hours

Information System Impacts

While the impact of the Information System on access to care was not a primary focus of the evaluation, some findings emerged. The patient booking and scheduling software features that contribute to access were generally well received by support staff. The ability of providers to now make appointments for specific groups of individuals at the time of the visit improved access to primary care services for some patients. For example, at one site, attendance at follow-up appointments for

> *"It's been quite overwhelming the number of well women's exams she's done and the number that would have otherwise not been done in the area."*
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- Community Representative

patients with mental heath issues increased when providers made the follow-up booking electronically before the patient left the office. However, interviews with providers revealed a negative effect on workload because of the increased time required to chart using the information system.

As the time-related findings were self-reported the actual time difference required for SPCI electronic charting compared to pre-implementation paper charting is unknown. The overall impact on patient access is unclear. At one site, direct patient care appointments were removed from the schedule to give providers time to complete their documentation using the electronic patient record. Many providers also reported working longer hours and having more work remaining at days' end. This may explain why patients perceived no change in access. It is also not known if patient visits provided by the additional providers hired during the Initiative offset the loss of visits by providers who reported seeing fewer patients per day as a result of the change in charting.

Summary

The SPCI achieved a major objective in providing access to an interdisciplinary team that included a family physician and nurse practitioner practicing collaboratively. In general, the SPCI does not appear to have affected patient access to urgent care. There was no change in where patients first seek their care, and no change in patient perception about availability of services outside of normal clinic hours. Access for some traditionally under-serviced groups was addressed with implementation of site-specific strategies to reduce barriers and respond to needs. The addition of the nurse practitioner is believed to enhanced access for under-serviced groups.

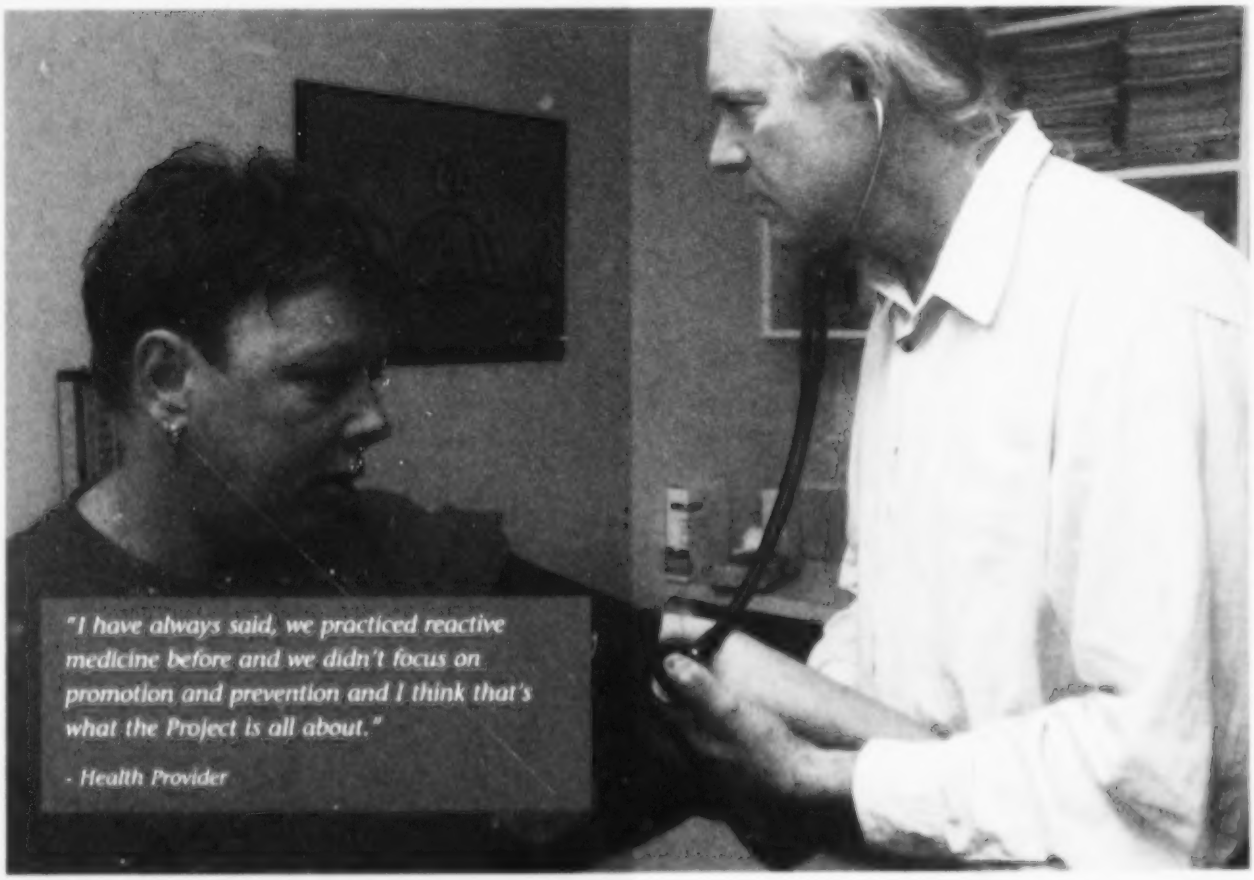
In addition, some sites expressed concern that the information system actually reduced patient access, because of the amount of time required to record patient data electronically. It is not known if this loss was off-set by the addition of new providers hired during the project or by the extra hours providers worked.

STRENGTHENING PRIMARY Care IN NOVA SCOTIA COMMUNITIES

Goal 4: Increasing Emphasis on Health Promotion and Disease Prevention

Related to the goal of increasing emphasis on health promotion and disease prevention, the SPCI was intended to achieve the following objectives:

- there is an increased focus of primary care organization/group programs and services on health promotion through individual and group activities
- primary care organizations/groups are effectively linked with other groups and organizations engaged in health promotion and illness prevention
- primary care organizations/groups recognize and increase individuals'/ families'/and communities' capacity for self-care and healthy living



"I have always said, we practiced reactive medicine before and we didn't focus on promotion and prevention and I think that's what the Project is all about."

- Health Provider

Progress Toward the Goal

Increased Focus on Health Promotion Activities

There was an increased emphasis on both individual and community-level health promotion activities at all sites throughout the demonstration period. The focus groups suggested that the health promotion work of the sites was enhanced by the nurse practitioner and in some cases, other providers, including the nutritionist in one site and the SPCI project coordinator in another site. Examples of health promotion activities for individuals that were added or enhanced at the site included: screening for cervical, breast and prostate cancer, screening for hypertension, diabetes and cardiovascular disease, education about exercise, healthy eating, weight loss, and sexuality. Examples of community-level activities included: teen and adult cooking classes, grocery store tours to learn how to read food labels, activities to reduce tobacco use, education sessions on a variety of topics such as menopause, and development of a community-garden.

Through the patient survey, patients were asked if they had ever been contacted to come into the clinic for a health promotion activity, such as immunizations. Of the 34% of patients who had been contacted, 75% reported that they definitely or probably made an appointment in response to being called. The vast majority of people who were called to come in for a health promotion activity were very or generally comfortable with being contacted (96%). Among those patients who had not been contacted to come in for a health promotion activity, again the vast majority indicated that they would be very or generally comfortable with such a contact (92%, n= 534).

Two features of the information system were designed specifically to increase health promotion and disease prevention: a customizable patient recall feature and computerized alerts. Although patient survey results indicate that patients are very receptive to being called in to the clinic for a health promotion activity, recall lists (which identify patients requiring regularly scheduled health promotion/disease prevention procedures) were promoted but only taken up by one of the sites in the last six months of the Initiative. Customized computerized alerts prompt providers to initiate health promotion-related counseling. Opinion was divided about the effectiveness of the prompts. Providers interviewed found some of the prompts to be somewhat or very effective, such as the smoking cessation alert (47%) and the adolescent sexual counseling alert (46%). However, alerts were also strongly perceived by several providers to have annoying qualities that detracted from their potential effectiveness.

Health Promotion Linkages

Throughout the demonstration period, sites developed a variety of new linkages with others in their community involved in health promotion. Linkages were made with the YMCA for nutrition and exercise education programs, weight clinics, a hearing screening program, addiction services, schools, and seniors' organizations. The linkages reflect the broad range of health promotion issues that sites addressed throughout the SPCI. It is interesting to note that while in many cases the site approached other organizations to partner around a specific issue, as the sites became known for their work with the SPCI, other providers and organizations approached the sites to develop partnerships.

Increased Capacity for Self-Care and Healthy Living

The proportion of patients surveyed who reported knowing more about illness prevention increased significantly by the end of the demonstration period, from 58% to 65% ($p<0.05$).

A relatively high proportion (70%) of patients surveyed before the demonstration period indicated that they felt knowledgeable about looking after their own health. These scores remained high (73%) and did not change significantly after SPCI.

From the perspectives of providers and staff, two of the sites felt that they could not comment on the impact of the SPCI on community self-care, with one group suggesting that it is too early to measure this. One site reported that the community has become more actively involved in health care since the beginning of the SPCI, and one site reported that the growing emphasis by the medical community in general to promote self-care and healthy living is paying off.

"For whatever reason, it was not by design, our clinic is becoming a community health centre. We didn't go out and say, hey, we need a physiotherapist here. He came to us. We didn't call up Mental Health Services and say, hey, you have to come over here and give us some help, they called us. And that's as a result of the Project."

- Health Provider

"I talk to them about walking and exercise and some of them will take it to heart and they'll come back and their blood pressure is beautiful."

- Health Provider

"You come, you can be weighed, she keeps a log and so go you of your weight if you're trying to lose weight and she encourages you to eat different foods and each week she'll have a talk on something related to a different lifestyle."

- Community Representative

Summary

All sites reported an increased emphasis on health promotion and illness prevention, primarily through the work of the nurse practitioner both in the clinic and the community. The nurse practitioner enhanced health promotion and disease prevention activities at the sites, and in some cases offered outreach services to clients in the community. Other providers also contributed to the increased emphasis on health promotion.

Computerized alerts were somewhat effective in increasing health promotion-related counseling. An extended implementation time period may have allowed for increased uptake of the patient recall software feature, possibly enhancing further health promotion and disease prevention activities.

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Goal 5: Improving Collaboration

Related to the goal of improving collaboration, the SPCI was intended to achieve the following objectives:

- primary care services are provided by an interdisciplinary team that must include a family physician and nurse practitioner who practice collaboratively as principal primary care providers for individuals and families. The team may be enhanced by the inclusion of other health professionals
- primary care organizations/groups promote a climate of respect, trust and support for shared decision-making
- decisions regarding the most appropriate provider to deliver a certain service are made within the context of patient preference, provider competence and other considerations
- the interdisciplinary team respects the clinical autonomy of health professionals to make decisions based on best evidence and the individual's and the family's wishes

Progress Toward the Goal

Developing Collaborative Relationships
Findings from the focus groups and site interviews indicate that collaboration has improved at all sites included in the Initiative. That collaboration was a focus of the SPCI gave providers the impetus to find the time for more organized case management. The emphasis on collaboration also strengthened existing collaborative arrangements among providers and re-introduced the possibility of resuming collaborative relationships within the local medical community.

While collaboration was successful at all sites, collaborative relationships took time to develop and improved over the initiative. Family physicians indicated only positive benefits to with practices with the addition of the nurse practitioners to the collaborative practice team.

A key factor cited as particularly helpful in supporting the establishment of collaborative relationships was the involvement of providers' professional associations and the Department of Health. These organizations provided support in the establishment of collaborative practices through mechanisms such as collaborative practice workshops.

It is important to note that prior to participating in the SPCI, most physicians had some previous experience in collaborative practice with other providers.

A variety of activities were undertaken throughout the duration of the SPCI to build and sustain collaborative relationships among providers at each of the sites. Activities included:

- attending a collaborative practice workshop
- site visits from the SPCI collaborative practice consultants (a physician and a nurse practitioner)
- developing site-specific plans to enhance collaborative practice
- regular conferencing about patients that are shared among providers
- ongoing consultation among providers as outlined in the document "Guidelines for Nurse Practitioners in Collaborative Practice in Demonstration Sites"

One aspect of collaboration, communication of patient information was enhanced by the IS. About two thirds of the providers and support staff interviewed reported improved access to information was a factor in improving communication, particularly at centers with larger numbers of staff. Awareness of other team members' roles may have increased as a

"Initially, the providers must know if collaboration is for them – all parties. . . they need to define their perspective on collaboration."

- Provider

"Sure, there have been some changes in the way that we work together, if you are looking at me and the physician. I found that the 'Jones and Way' workshop helped to build more understanding of the collaborative practice, of what it should look like, how to work better together. We had seemed to be working in parallel rather than together, and according to J&W that's a common problem for collaborative practices. So we got more communication going, thinking up strategies to to overcome that."

- Provider

result of the multidisciplinary use of the information system. However, informal collaborative interaction among the health team at one site is reported to have decreased somewhat as a result of changes in charting routines due to the information systems.

Patient Perceptions of Collaboration

Most patients participating in the patient survey (95%) reported at the end of the demonstration period that they believe that the health professionals at their clinic communicate and work well with one another.

Patients were also comfortable with the number of providers involved with their care. The proportion of patients surveyed who expressed comfort increased 51% to 60% ($p<0.001$) during the demonstration period ($p<0.001$).

Summary

The SPCI appears to have improved and strengthened collaboration among participating primary care providers at all sites. The SPCI appears to have strengthened collaboration between the demonstration and other health care providers in the community.

The involvement of the Department of Health and providers' professional associations were important supports in collaborative practices.

"I trust [the nurse practitioner's] judgment and I know she'll come to me if there's anything at all she is concerned about. . ."

- Provider

"There seems to be a respect there, with the providers within the project and the providers within the building. And I could probably extend that to other service providers like diabetes education, working together . . ."

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STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Goal 6: Improving Accountability

Related to the goal of improving accountability, the SPCI was intended to achieve the following objectives:

- primary care organizations/groups ensure ongoing provision of care focused on community-identified needs, and clearly identified standards
- the patient/client, family and community participate in planning and evaluation of the provision of primary care services
- primary care organizations/groups provide effective communication so that community members understand their primary care organization
- the patient/client and family select and maintain an ongoing relationship with a family physician and nurse practitioner as principal primary care providers, and with the rest of the primary care organization
- primary care organizations will ensure that information used in planning or for public discussion protects the privacy, security and confidentiality of patients/clients and families
- primary care organizations and providers support each other in delivering high quality service through professional development, healthy working conditions and quality work life
- primary care providers practice collaboratively showing mutual respect and trust
- the Nova Scotia Department of Health develops and supports an evaluation framework for the primary care demonstration project
- the Nova Scotia Department of Health approves the projects for funding under the Strengthening Primary Care Initiative
- the Department of Health and the primary care organization/group work together to develop flexible funding mechanisms that enhance fiscal predictability
- primary care organizations/groups provide high quality health information and data to support decision-making and evaluation
- the Department of Health sets standards for information privacy, security and confidentiality, for use by the primary care organization/group for the protection of the public
- the Department of Health ensures the regulatory bodies of the medical and nursing professions develop a process whereby they jointly approve the guidelines for nurse practitioners in collaborative practice in primary care demonstration project sites
- the patient/client, family and community participate in planning and evaluation of the primary care demonstration project site

Progress Toward the Goal

Communicating with the Community

Patient survey results found that there was a slight increase in the level of awareness about site services from 64.6% to 66% ($p<0.001$).

The sites used a variety of strategies to communicate with their communities, including newsletters, newspaper articles, radio interviews, open houses, brochures, posters and meetings with other community organizations.

Professional Development and Quality of Work Life

Most participants in the second round of site interviews reported a higher degree of job satisfaction which improved during the demonstration period. Central to the reports of high job satisfaction were correspondingly high levels of autonomy and communication.

The four nurse practitioners, who were the only ones practicing in the province, reported challenges in accessing relevant continuing education opportunities.

Department of Health Accountabilities

As part of the SPCI, the Department of Health was responsible, under Health Canada's HTF Fund, for funding the demonstration sites, developing an evaluation framework, developing flexible funding arrangements, setting standards for information privacy, security and confidentiality, for use by the sites, and working with the regulatory bodies of the medical and nursing professions to develop a process whereby they jointly approve the guidelines for nurse practitioners in collaborative practice at the sites. All of these tasks were completed during the course of the SPCI.

Data to Support Decision-Making and Evaluation

The greatest impact of the information system on the goals of the initiative was in improving accountability. Comprehensive clinical information, provider appointment and scheduling information were extracted from the information system databases. Previously these types of information were only available through time consuming manual audits or costly self -reported surveys.

Summary

Overall, sites reported that high degrees of administrative and clinical accountability were maintained throughout the demonstration period and the Initiative has helped to improve many facets of accountability among patients, practices, communities and the Department of Health.

Accountability has improved at many levels, provincial through the development of legislation to support the practice of nurse practitioners, in local communities through the participation , planning and implementing and evaluating SPCI and primary care organizations through the establishment of formal collaborative practice agreements and providing high quality data for the evaluation of SPCI.

Communication with the communities served by the sites also seemed to be successful throughout the SPCI. Each site reported that understanding of the SPCI increased over time, both among those working at the sites and within the communities.

STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Introduction

The SPCI was intended to implement changes in the traditional ways in which primary care is delivered, and to evaluate the impact of the changes in demonstration sites. Specifically, three strategies were originally planned for implementation, including:

- hiring a nurse practitioner to practice collaboratively with one or more family physicians and other members of an interdisciplinary primary care team
- adopting alternative payment mechanisms for primary care physicians
- adopting and using computerized information systems to support primary care service delivery

This section summarizes some of the key lessons learned about implementing the nurse practitioner and information systems strategies, (as described previously, the alternative funding strategy was not implemented).

Introducing Nurse Practitioners in Collaborative Practice

Most providers and staff at each of the sites believed that the role of the nurse practitioner was well integrated at the practice level. Most participants in the focus groups and site interviews saw the implementation of the nurse practitioner in collaborative practice with a family physician as a major benefit of the SPCI, and the nurse practitioner was seen to positively impact on most of the goals of the Initiative. A number of lessons were learned about the process of implementing the nurse practitioner role in a primary care organization/group.

Lessons Learned

- It takes time to integrate the nurse practitioner role into an existing primary care practice. Efforts must be made to differentiate the role of the nurse practitioner from existing providers, and time must be spent educating providers, staff, patients and the community about the role of the nurse practitioner.
- The role that nurse practitioners play in community-based health promotion is vital, yet the time required for community programming competes with nurse practitioner's time spent in clinical practice. In order for community programming to occur, sufficient time in the nurse practitioner's schedule must be protected for the necessary planning and implementation of these activities.
- Developing collaborative practice relationships takes time, effort, and support from external bodies. The support provided by the Department of Health and providers' regulatory bodies was essential in the development of collaborative practices within the SPCI.

Prior to implementation, it was expected that patients and communities might be reluctant to seek care from a nurse practitioner because of unfamiliarity with this type of provider. However, at all sites, the vast majority of patients had no hesitation in receiving care from a nurse practitioner, and were enthusiastic about the addition of her role to the clinic. Because of their small numbers, there is a need to ensure that continuing education opportunities are available and accessible to nurse practitioners in Nova Scotia.

STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Introducing Information Systems

Most providers supported the concept of an electronic record. At the end of the initiative 85% of providers continued to use the clinical software. The information system improved the readability of patient records and increased the ease with which patient information could be accessed. The process of electronic charting and the perceived complexities, deficiencies and unfriendliness of the software required adaptation and lengthened charting time for most providers resulting in some negative impacts on workload.

With the exception of the billing software, the practice management software appeared to be accepted by support staff. The billing software was described by most as not user-friendly, complicated and/or time-consuming. At project end, all support staff were using the practice management software to some capacity.

Patients appear to have taken computerization in stride and seemed pleased that their primary care sites are in touch with the future.

Lessons Learned

- Implementing an EPR is a considerable undertaking for primary care clinics. The initial investment of effort and time required to install systems, train users, convert data and develop user familiarity is very large and must not be under-estimated. There may potentially be provider workload impacts.
- Sufficient time must be given when selecting electronic patient record software systems to ensure that a thorough hands-on review is conducted.
- Billing applications should be provincially accredited and thoroughly reviewed as part of the vendor evaluation.
- On-line access to laboratory and diagnostic imaging reports is an essential component of an electronic patient record system.
- Clinics considering implementing EPRs are strongly encouraged to ensure that all providers at the clinic agree to chart their visits using the EPR software.
- Use of the EPR in the patient's presence maximizes the potential benefits (e.g. electronic prescribing) that can be derived from the system. Providers require access to the EPR from within their examination rooms.
- To ensure good quality data: providers need to be involved in identifying indicators that are relevant to their patient population.
- An increased clinical perspective in training and ongoing support for providers is critical in ensuring the IS is used to its full potential.

STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Implementing the SPCI

A significant amount of change was introduced at the study sites over the course of the SPCI. The SPCI simultaneously implemented a new primary care provider and collaborative practice environment, an advanced information system, a new payment mechanism (in one site) and a comprehensive evaluation. The magnitude of change was enormous, and required a high level of commitment and support from communities, providers, and government.

Lesson Learned

Primary care organizations and their communities require support to build on existing strengths and increase their capacity to implement new ways of organizing, delivering and funding primary care services. Managing this type of change is critical. It requires ongoing planning and commitment by a wide range of champions, including communities, providers, stakeholders and government.

- Changes to the way primary care is delivered should be made gradually to allow providers to continue to provide care while changing the way that they deliver care.
- A longer transition between the planning and implementation stages would have benefited the demonstration sites.
- A two-year demonstration period is not long enough to effectively evaluate all of the goals and objectives established for the SPCI.
- Communication is key to supporting demonstration projects, and therefore an effective communication plan must be developed and implemented with adequate resources.
- Evaluating changes in primary care delivery is a complex and time consuming process that requires adequate and consistent resources in order to be successful.

STRENGTHENING PRIMARY care IN NOVA SCOTIA COMMUNITIES

Appendix A
Goals and objectives of the SPCI

This section outlines each of the goals of the Strengthening Primary Care Evaluation Initiative, as well as the objectives for each goal.

1. *TO IMPROVE PATIENT/CLIENT CENTERED PRIMARY CARE*

The individual, family and community should be central to primary care

- Individuals maintain the right to choose their principal primary care providers.
- Individuals, families and providers are supported in making informed decisions.
- Care is coordinated and integrated to ensure seamless access for the individual and family in the optimal setting.
- Care and service are based on the individual's and family's health care needs.
- Ongoing and respectful relationships among individuals, families and providers are fostered.
- Individuals and families receive quality care from competent, responsible, providers in a timely manner.

2. *TO IMPROVE RESPONSIVENESS OF PRIMARY CARE ORGANIZATIONS/ GROUPS TO COMMUNITY NEEDS*

Primary care organizations/groups should be responsible for ensuring they are in touch with and responsive to their communities

- Communities are encouraged to participate in partnership with the primary care organizations/groups and with others in finding solutions and ways of re-designing the delivery of primary care services.
- Primary care organization/group governance and/or advisory structures involve community representation.
- Primary care organizations/groups understand their various communities (including city/town/village distribution, people with special needs resulting from physical, mental, cultural, socio-economic or other factors), and are responsive to clearly defined community health needs.
- Primary care organizations/groups develop partnerships with under-serviced groups within the population (including cultural and minority groups) to implement strategies to meet their primary care needs.
- The scope of services will take into account local population requirements, geographic location, and the availability of other services and resources.

3. *TO IMPROVE ACCESS TO COMPREHENSIVE PRIMARY CARE SERVICES*

- Comprehensive primary care services should be available to all Nova Scotians.
- Everyone served by the primary care organization/group has access to an interdisciplinary team including a family physician and a nurse practitioner practicing collaboratively.
- Primary care organizations/groups provide or arrange for 24-hour urgent care.
- Primary care organizations/groups enhance access for those who face barriers in the current system, including minority and cultural groups, mentally ill, the chronically disabled and the poor.

4. *TO INCREASE EMPHASIS ON HEALTH PROMOTION AND ILLNESS PREVENTION*

Primary care organizations/groups should promote health and prevent illness through education, services and advocacy.

- There is an increased focus of primary care organization/group programs and services on health promotion through individual and group activities.
- Primary care organizations/groups are effectively linked with other groups and organizations engaged in health promotion and illness prevention.
- Primary care organizations/groups recognize and increase individuals'/families'/and communities' capacity for self-care and healthy living.

5. *TO IMPROVE COLLABORATION*

Primary care providers should work collaboratively with patient/clients, each other, and with other health professionals and programs throughout Nova Scotia.

- Primary care services are provided by an interdisciplinary team that must include a family physician and nurse practitioner who practice collaboratively as principal primary care providers for individuals and families. The team may be enhanced by the inclusion of other health professionals.
- Primary care organizations/groups promote a climate of respect, trust and support for shared decision-making.
- Decisions regarding the most appropriate provider to deliver a certain service are made within the context of patient preference, provider competence and other considerations.
- The interdisciplinary team respects the clinical autonomy of health professionals to make decisions based on best evidence and the individual's and the family's wishes.

6. *TO IMPROVE ACCOUNTABILITY*

Primary Care services should be provided within a framework that defines specific areas of responsibility and accountability for patients/clients, families and communities, providers, primary care organizations, community and regional health boards, and the Nova Scotia Department of Health. These accountabilities should be jointly developed and supported by appropriate infrastructures.

Note: It is recognized that within the various accountability relationships in the primary care system, there are a number specific areas of accountability that are beyond the scope of the Strengthening Primary Care Project to influence and/or evaluate. These objectives include only those which can be influenced by the demonstration project sites or evaluated within the evaluation framework of the project.

Accountability between the primary care organization/group and patients/clients, families and communities.

- Primary care organizations/groups ensure ongoing provision of care focused on community identified needs, and clearly identified standards.
- The patient/client, family and community participate in planning and evaluation of the provision of primary care services.
- Primary care organizations/groups provide effective communication so that community members understand their primary care organization.
- The patient/client and family select and maintain an ongoing relationship with a family physician and nurse practitioner as principal primary care providers, and with the rest of the primary care organization.
- Primary care organizations will ensure that information used in planning or for public discussion protects the privacy, security and confidentiality of patients/clients and families.

Accountability of the primary care providers to each other.

- Primary care organizations and providers support each other in delivering high quality service through professional development, healthy working conditions and quality work life.
- Primary care providers practice collaboratively showing mutual respect and trust.

Accountability between the Nova Scotia Department of Health and the primary care organization/group.

- The Nova Scotia Department of Health develops and supports an evaluation framework for the primary care demonstration project.
- The Nova Scotia Department of Health approves the projects for funding under the Strengthening Primary Care initiative.
- The Department of Health and the primary care organization/group work together to develop flexible funding mechanisms that enhance fiscal predictability.
- Primary care organizations/groups provide high quality health information and data to support decision making and evaluation.

Accountability between the Department of Health and patients/clients, families and communities.

- The Department of Health sets standards for information privacy, security and confidentiality, for use by the primary care organization/group for the protection of the public.
- The Department of Health ensures the regulatory bodies of the medical and nursing professions develop a process whereby they jointly approve the guidelines for nurse practitioners in collaborative practice in primary care demonstration project sites.
- The patient/client, family and community participate in planning and evaluation of the primary care demonstration project site.

Appendix B: Brief Description of Evaluation Methods

This Appendix provides a brief description of each evaluation method. Detailed technical information about the evaluation framework and data collection methods is available by contacting the Primary Health Care Section, Nova Scotia Department of Health.

- **Focus groups** were conducted pre- and post-implementation with site health providers and administrative staff, off-site health providers and community representatives. At pre-implementation, 109 people participated with 67 participating in the post-implementation focus groups.
- **Patient focus groups** were conducted pre- (n=45) and post-implementation (n=16) at the one site that did not participate in the patient survey.
- **Patient surveys** were conducted over the telephone pre- (n=1,767) and post-implementation (n=806) with patients at 3 of the demonstrations sites. The patient surveys were designed to evaluate whether specific outcomes had improved over the course of the project and to describe perceived health status and the perceptions and attitudes of primary care patients about the health care they received at the demonstration sites.
- **Individual site interviews** were held face-to-face with providers and administrative staff at all four sites in the pre-implementation time period. The interviews were designed to determine how well the interventions were implemented (n=37). Post-implementation interviews were conducted over the telephone to explore the impacts of the interventions and identify any major changes since the baseline interviews (n=34).

- A **chart audit** was performed at the study sites in the post-implementation time period. Pre-implementation data was collected retrospectively at the same time. The purpose of the chart audit was to determine the impact of the project interventions on the quality of the process of care and to assess proxy measures for specific health outcomes for diabetes and hypertension. A total of 211 patients participated in the diabetes chart audit and 541 patients participated in the hypertension chart audit.
- **Data from the practice management system** was analyzed to determine to proportion of providers' time spent in various clinical and administrative activities. The clinical software provided the data to determine prescribing appropriateness. Clinical information from 4,899 consenting patients and practice management information from the 4 demonstration sites was extracted for analyses.
- **Quarterly reports** were submitted by each demonstration site throughout the duration of the project to the Department of health to assist in the ongoing assessment of progress.
- **Site observations** were conducted by SPCI staff
- **Information Systems Surveys** with providers and support staff were conducted in the post implementation time period.

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Strengthening Primary Care: Summary of Evaluation Results

Impact of a Primary Care Office Information System: Summary Report

September 2004

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Consultants to the Primary Health Care Section, Nova Scotia Department of Health.

Introduction

The primary purpose of this study was to evaluate the impact of an information system on four primary health care practices involved in the Strengthening Primary Care Initiative (SPCI) in Nova Scotia. Each site was required to: hire a nurse practitioner to practice collaboratively with one or more family physicians and other members of an inter-disciplinary primary care team; adopt alternative payment mechanisms for primary care physicians; adopt and use computerized information systems to support primary care service delivery; and participate in evaluating the initiative.

The information system (IS) implemented at the four sites (3 rural, 1 urban) participating in the Initiative consisted of a clinical software application, practice management software, hardware and software support.

The selection process by project staff and the Information Systems Working Group (ISWG) included the development of a comprehensive list of requirements for an integrated clinical and practice management system. A vendor selection committee including clinical and support staff from the four sites and a nurse practitioner representative unanimously selected a clinical software application solution, following a detailed evaluation process conducted within the constraints of the initiative.

The clinical software application featured an electronic patient record (EPR) that presents the clinical note in a highly structured, very detailed SOAP (Subjective Objective Assessment Plan) format. Additional features included alerts for drug interactions, and a chart summary feature for allergies, medications, diseases, and clinical procedures. Custom software was developed to provide automated health promotion alerts. The clinical software application has the capacity with custom development to provide on-line access to laboratory and other diagnostic results. However, funding for this feature was not included in the SPCI and subsequently was not developed. The practice management suite included: an electronic scheduler, a patient registry, a provider registry, a customizable patient recall feature, an automated referral letter writer, and a billing application that is integrated with the electronic patient record.

With the exception of the billing application the IS was successfully installed at all four demonstration sites by September 2000. Numerous challenges with the vendor's billing software delayed accreditation and implementation until December 2001.

Comprehensive training was provided prior to implementation. The initial program included an introduction to computers, practice management training, clinical management training, system operations and chart conversion training. Subsequent training included: follow-up sessions for new or updated software components, a 'train the trainer strategy' for each site, and ongoing support by the SPCI information system consultant.

Within a year of installation, 85% of providers (n=19) reported documenting some portion of their patient visits in the electronic patient record. Among those, 11providers were documenting 95-100% of their patient visits in the EPR, 2 were documenting 65-83%, and 3 were documenting 15-30%. At the end of the initiative, 85% of providers continued to use the clinical software to some capacity.

All support staff continue to use some components of the practice management software. There was considerable dissatisfaction with the billing interface. Within one year of implementation, support staff at two of the sites reverted to their former billing system for physician claims.

Custom chart conversion strategies were developed for each of the sites to accommodate the site's needs while meeting SPCI data requirements The chart conversion process identified and captured essential clinical information from the paper chart required in the new electronic patient records. An additional staff member was hired at each of the sites to assist with chart conversion data entry requirements.

As a requirement of the project, providers and staff were asked to populate specific structured fields for evaluation purposes. The list of structured fields was finalized and communicated to the sites in June of 2001.

[1] *We gratefully acknowledge the contributing work to this report of Anne Martell, Martell Consulting Limited, Jim Dehner, Corporate Research Associates, and Noreen Miller.*

Methods

Several methods were employed to evaluate the impact of the information system: surveys, focus groups, individual interviews and electronic database extracts.1-7 IS-specific telephone surveys with providers (n=20) and support staff (n=19) were conducted in the post-implementation time period, November-December 2002. The provider group consisted of 7 physicians, 4 nurse practitioners, and 9 others (nurses, mental health and other team members). The IS surveys included both open-ended and structured questions. Patient from three of the sites were surveyed (n=806) over the telephone from April to September 2000, prior to the implementation of the information system, and again from June to September 2002, 18-24 months after implementation of the information system.

Focus groups were conducted at all sites in both the pre- and post-implementation time periods with three groups, providers and staff, other health professionals associated with the demonstration sites and community representatives. The focus groups were conducted in the summers of 2000 (n=100) and 2002 (n=67). Patient focus groups were held only at the site that declined participation in the patient survey, 45 patients participated in the pre-implementation and 16 in the post-implementation focus groups.

Individual site interviews were conducted face-to-face with provider and administrative representatives from the four demonstration sites in the pre-implementation time period from May to November of 2000 (n=37). Post-implementation telephone interviews were conducted from September to November of 2002 (n=37).

Information system data extracts were downloaded at the four demonstration sites during January and February 2003. Practice management queries were answered using data entered in March and April 2002 (22,808 appointment entries). Clinical queries were answered with data entered for 4,899 consenting patients from April 1, 2001 to March 31, 2002.

Key Findings

Receptivity

All except two IS survey participants reported being somewhat or very receptive to the idea of implementing a new information system at program inception. All support staff reported that they were somewhat or very computer literate prior to the installation of the new information system. Only 60% of providers reported being somewhat or very comfortable using computers prior to the project. However, at the end of the project 95% of providers reported being somewhat or very comfortable using computers.

In the pre-implementation patient survey most patients (85%) anticipated they would be comfortable with the use of computers during their health care visits. Post-implementation findings demonstrate that this anticipated comfort level was realized. 95% of patients whose health care providers used computers during their visits reported being comfortable with the practice. In addition, the vast majority of patients (90%) had no concerns about the use of their patient chart in the computer.

Impact on time

For support staff, a gain or loss in time to perform administrative functions using the new information system varied according to the task being performed. Preparing day sheets and finding patient information were reported by site support staff as taking less time, booking patients and completing billing tasks took more time. Interviewees' remarks suggested only billing tasks consumed inordinate amounts of time. The billing application was reported as not user-friendly, too complicated, and time consuming to input billing codes (more steps) and to resolve problems, compared to the old system. As a result, use of the billing application was partially discontinued at two sites.

Electronic charting was time consuming for most providers. 68% of providers reported that charting took more time using the electronic patient record compared to the paper chart. Type of provider, pre-implementation comfort level with using computers and location were not factors associated with time reported for charting ($p>0.05$). Reasons given for the increased charting time were the time-consuming searches that involved clicking through several selections to find the appropriate structured fields, descriptors or diagnoses, and then potentially having to open text boxes to document the visit. These difficulties were exacerbated when the template did not suit the provider's health care discipline or when patients had complex or multiple problems. For a few participants, difficulty typing was another factor that lengthened charting time. Attempts to streamline charting by customizing templates for specific encounters (e.g., well women visit) were partially successful. Providers' time constraints were described as a barrier to their participation in further customization. Several providers adapted to the increased charting time by charting later, increasing the hours they worked and/or reducing the number of patients seen. The providers who discontinued using the system cited few benefits (such as easy access to lab information) and an inefficient, cumbersome charting process, while others voiced they would not do so even with the increased time involved because of the system's benefits. However, even after two years of use, the increased charting time remained a problem.

The following work impacts were described by providers: 68% reported working more hours, 39% reported seeing fewer patients than before the Initiative and 74% reported more work remaining at the end of the day. Among the providers reporting a change, the majority believed the computer was a contributing factor to these changes.

Views about the system

Overall, site support staff was satisfied with the practice management software particularly with respect to the enhanced ability to retrieve patient information; the ease with which reports could be printed off; the ease of booking patients; and the legibility of the EPR. The billing application was the most frequently cited challenging adjustment for support staff. Contributing to the widespread dissatisfaction with the billing software were implementation problems, user-unfriendly software,

problems finding diagnoses and statement data and/or reconciliation download problems.

Providers reported the EPR offered many benefits in accessing and retrieving useful legible information. Patient information was readily available without having to search for a paper chart. In addition, some participants liked the concise, chronological presentation of clinical information (e.g. clinical notes, problem lists, past history, allergies and medication lists) that facilitated care. Convenient access to the patient record during telephone consultations was reported.

Many providers identified the lack of online laboratory results as a major deficiency. Not being able to electronically obtain results directly from labs and other diagnostic services did not allow the system to be implemented as some providers expected, and has meant the continuation of paper charts and/or some manual entry of data into electronic records. Problems manipulating patient summary features were also encountered and prevented full realization of the software's potential.

Many providers reported they liked the electronic charting templates finding them helpful in organizing clear and informative notes, and when charting single, straightforward patient problems. In interviews providers occasionally reported that the prompts offered by the EPR templates had improved their clinical assessment, history taking, physical examinations and charting skills. Nonetheless, many found electronic charting was their most challenging adjustment, complicated by unfriendly aspects of the software and a time-consuming, cumbersome charting process.

Impact on documentation

Most providers agreed that the clarity and completeness of documentation improved using the electronic patient record. Clarity of documentation improved for 88% of providers, with increased legibility a positive impact. Although the completeness of documentation improved for 67%, the overall gain was small. If the template prompts were completed documentation could be more specific and comprehensive for some problems. However, for psychosocial or patient education encounters the descriptors were often lacking. Sometimes the descriptors offered were less informative (e.g. diagnosis of 'joint paint, lower limb') than the provider's preferred choice ('knee arthralgia').

Chart conversion information, particularly past medical and surgical history, was useful to only about a third of the providers. The information was less useful if patients were well known to the provider or if the information was not in a useful form.

Training

Slightly more than half of the support staff described their training as adequate to excellent, while a third found their training was inadequate or not useful. Dissatisfaction with support staff training appeared to be related mostly to the billing component and the delays between training, installation and implementation of the system.

Half the providers found their training to be adequate or useful while a third indicated their clinical software training was inadequate. Training did not adequately meet the needs of those with low computer literacy. Learning the software was described as an experiential process, a "hands on" "trial & error" process that required time. Maintaining productivity while learning the program and integrating it into professional practice was one of the providers' most challenging adjustments. Moreover, a clinical perspective in the training that may have helped providers better understand and use the software capabilities was lacking for some participants.

Impact on communication & collaboration

About one third of providers and support staff reported no impact from the IS in the way they

communicate or work. Other providers and support staff reported improved access to information, particularly at centers with larger numbers of staff, as a factor in improving communication of patient information. Awareness of other team members' roles was heightened as a result of the multidisciplinary use of the IS as their roles are made explicit in the referral component of the clinical notes.

Half the providers reported there were no significant changes in their communication with patients. Concern was expressed that the computer could divert attention from the patient, thus interfering with rapport. Two strategies used by providers to maintain a patient focus in the encounter were to avoid looking at the screen while interacting and/or charting after the encounter. From a patient perspective, the computer had little impact on provider-patient relationships. In the post-implementation patient survey, the majority of participants reported that they are definitely (70%) or probably (20%) as comfortable talking about their health concerns now that their provider is using a computer. Patient focus group participants indicated they were comfortable with health practitioners entering data in the midst of consultations.

Health promotion and illness prevention

The patient recall feature (a software tool that has the potential to increase health promotion and illness prevention encounters) was promoted but implemented by only one of the sites in the last six months of the initiative. The perceived effectiveness EPR health promotion counseling alerts was mixed. Customized computerized alerts prompt providers to initiate health promotion-related counseling. Forty seven percent of providers found the smoking cessation alert and 46% found the adolescent sexual counseling alert effective in reminding them to give the appropriate counseling. Only 25% of providers found the breastfeeding alert somewhat effective. Alerts were strongly perceived by several providers to have annoying and intrusive qualities that detracted from their potential effectiveness.

Impact of the evaluation

The use of specified structured fields for evaluation purposes commenced several months after system installation. Some providers found it a challenge when charting to remember the fields required for evaluation. It was also time consuming.

The ability to extract data from the electronic scheduler and clinical software application permitted investigation of research questions concerning practice and clinical management. For example it was possible to determine the proportion of time providers spent in on- and off-site clinical activities, coordination of care, collaborative practice, professional development, project and quality assurance activities. Percentage of providers' time spent in billable and non-billable activities was also determined. The electronic patient records provided data to determine provider compliance with guidelines for the management of the three selected conditions: acute otitis media in children (10 years of age or younger), osteoarthritis and a topical inflammatory condition treated with corticosteriods in patients 65 years of age and older.

Conclusion

Most providers supported the concept of an electronic record. At the end of the initiative, 85% of providers continued to use the clinical software. The information system improved the readability of patient records and increased the ease with which patient information could be accessed. The process of electronic charting and the perceived complexities, deficiencies and unfriendliness of the software required adaptation and lengthened charting time for most providers resulting in some negative impacts on workload.

With the exception of the billing software, the practice management software appeared to be accepted by support staff. The billing software was described by most as not user-friendly, complicated and/or time-consuming. At project end, all support

staff were using the practice management software to some capacity.

An ideal information system in this context would support important practice management functions, and efficient documentation and retrieval of patient information in user-friendly ways. An ideal system would be compatible with the way providers practice in multidisciplinary settings.

Patients appear to have taken computerization in stride and seemed pleased that their primary care sites are in touch with the future.

Lessons Learned

1. Sufficient time must be given when selecting electronic patient record software systems to ensure that a thorough hands-on review of all options is conducted. The review must rigorously assess functional ability and ease of use from the perspective of all types of system users.

2. One of the benefits of implementing an information system is the ability to effectively monitor care delivery and health outcomes. Effective monitoring is dependent upon the quality of the information entered into the system. To ensure good quality data: providers need to be involved in identifying indicators that are relevant to their patient population; the software selection process should ensure that indicator data can be captured in a user-friendly manner; initial training programs should emphasize the importance of capturing this information in the software at all relevant patient visits; and, ownership for the promotion and management of data quality should lie within the clinic. Data extraction processes are required to provide the information and to monitor data quality.

3. Where possible, software customization should be completed prior to installation. Billing applications should be provincially accredited and thoroughly reviewed as part of the vendor evaluation.

4. On-line access to laboratory and other diagnostic reports is an essential component of an electronic patient record system.

5. Implementing an EPR is a considerable undertaking for primary care clinics. It is imperative that all parties involved are 'on-board' and receptive to making the implementation a success. The initial investment of effort and time required to install systems, train users, convert data and develop user familiarity is very large and must not be under-estimated. There may potentially be provider workload impacts. Clinics implementing EPR systems should consider limiting the introduction of any other major changes in their clinic in that year.

6. A mix of paper and electronic charting systems introduces redundancy in charting and is not recommended in a collaborative practice setting. Clinics considering implementing EPRs are strongly encouraged to ensure that all providers at the clinic agree to chart their visits using the EPR software.

7. Although considerable effort was put into training, several recommendations emerged from the data. An increased clinical perspective in training and ongoing support for providers is critical in ensuring the IS is used to its full potential. Possible solutions include establishing on-site clinical expert-users as a resource for other providers and the use of web-based interactive education tools. In addition, well-qualified, easily accessible and timely vendor support is important.

8. Use of the EPR in the patient's presence maximizes the potential benefits that can be derived from the system. Examples where functional software benefits are lost if charting is postponed include: electronic prescribing, the ability to be alerted for drug allergies or drug interactions, and the ability to access relevant on-line patient education handouts. Providers require access to the EPR and a printer from within their examination rooms in order to maximize the potential of the system. Training should also encourage and reinforce the importance of charting with the patient present.

9. Custom templates can be helpful when charting straightforward patient problems. Such templates can expedite electronic charting by making relevant options readily available to the provider. Achieving optimal benefits from custom templates requires upfront planning. Clinic staff will need to take time to participate in the development of these templates to determine the types of visits that are most conducive to custom templates and the relevant information to be captured in these templates.

10. Some areas of electronic charting with the selected software package presented considerable difficulties: maintaining current summary lists, searching for diagnoses, charting visits for patients with multiple complex medical problems and/or counseling and health promotion encounters. Future software selection processes should consider these issues and carefully evaluate software packages to ensure these tasks are handled in an effective and user-friendly manner.

11. Clinics considering implementing an EPR must be made aware of the additional administrative workload required to manage system administration tasks such as security privileges, hardware performance, network access, and daily back-ups. In this Initiative an additional .5 FTE staff member was hired to manage these tasks at each site.

12. Carefully consider chart conversion strategies. A significant amount of time, effort and resources were allocated to chart conversion in this project with limited perceived benefits resulting from the effort.

13. Alerts to remind providers about opportunities for disease prevention counseling during patient appointments show potential, but must be simple, applied with discretion, and designed to be as unobtrusive as possible.

Data Sources

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Strengthening Primary Care: Summary of Evaluation Results

Primary Health Care Practice Audits: Diabetes and Hypertension Summary Report

September 2004

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Background

This chart audit is a component of a primary care initiative created to implement and evaluate new models of primary care in Nova Scotia. The three main components to the Initiative implemented at each of the four demonstration sites were: to introduce inter-disciplinary teams involving at least one nurse practitioner and one family physician, to adopt and use computerized information systems to support primary health care service delivery and to adopt alternative payment mechanisms for primary care physicians.

The primary purpose of the chart audit was to determine the impact of project interventions on the quality of the process of care and to assess proxy measures for specific health outcomes for diabetes and hypertension at sites participating in the initiative. A pre-post format was used for this study with the pre-implementation time frame beginning from April 1, 1999 to March 31, 2000 and the post-implementation time period from April 1, 2001 to March 31, 2002.

Methods

The chart audit was conducted at the four primary care sites participating in the Strengthening Primary Care in Nova Scotia project. Three of the sites were in rural locations with the fourth site in an inner city community health centre.

The sampling frame, based on the Province of Nova Scotia Medical Services Insurance billing database, was derived from those patients who had at least one billing for a targeted condition during the period January 1998 to January 2000. Audits were performed at the sites on charts of consenting patients with one or both of the targeted conditions, diabetes and/or hypertension. Charts were examined for confirmation of the diagnosis. A total of 211 patients participated in the diabetes chart audit and 541 patients participated in the hypertension chart audit. There were more females than males in both samples, 53.6% in the diabetes and 56.8% in the hypertension sample. The age distribution was similar for both samples, 6.2% were less than 40, 47.9% between 41 and 64, and 46% 65 years of age and older in the diabetes sample. In the hypertension sample, 4.1% were less than 40, 45.5% between 41

and 64, and 50.5% 65 years of age or older. The majority of the diabetes population (93.8%) were diagnosed with Type 2 diabetes. The chart audit data were abstracted by the same researcher at all four sites from May to September 2002. The charts in the post-implementation time period were a combination of electronic and paper records. Only paper charts were available for the pre-implementation time period.

The diabetes variables of interest were derived from the Diabetes Quality Improvement Project indicators, the 1998 clinical practice guidelines for the management of diabetes in Canada, and guidelines from the Diabetes Care Program of Nova Scotia for the surveillance, prevention and management of diabetes complications. The hypertension variables of interest were chosen from the 1999 Canadian recommendations for the management of hypertension and lifestyle modifications to prevent and control hypertension. Descriptive statistics including frequencies and proportions were calculated for all outcome measures. McNemar's test and Wilcoxan signed-rank test were used to compare paired data pre- and post-intervention. The significance level was set at $p<0.05$. The Stata 6.0 computer program was employed for all statistical analyses.

Results

For several of the diabetes measures audited, no statistically significant differences were observed between the two time periods even though for many of these same indicators an increase in the proportion of patients meeting the standards increased over time. However, the proportions of patients with satisfactory blood pressure control, annual screening for nephropathy and retinopathy were higher in the post-implementation time period. Satisfactory blood pressure control (<130/85) was achieved by 28.5% of participants in the post- compared to 20.4% in the pre-implementation time period. The proportion of patients who had annual screening for nephropathy was 71.3% in the post-, compared to 61.7% in the pre-implementation time period. Among patients who experienced a change in process of care, patients were more than twice as likely to have gone from not receiving screening in the pre- to receiving screening for nephropathy in the post-implementation time period than to have been screened in the pre- and not in the post implementation period ($p<0.01$). The proportion of patients who had annual screening for retinopathy went from 33.8% in the pre- to 41.9% in the post-implementation time period.

The proportion of patients who were home blood glucose monitoring increased from 61.5% in the pre- to 69.1% in the post-implementation time period. Among patients with changed self care behaviour, over the course of the project patients were twice as likely to begin monitoring their blood glucose levels than they were to stop monitoring blood glucose levels at home ($p<0.01$).

Improvement was observed for several of the process of care, outcome and self-care measures for patients with hypertension over the course of the project. Among the measures used to assess management of care, frequency of monitoring blood pressure by providers was the only measure to show a negative change. Among patients with a change in process of care related to blood pressure monitoring, patients were 40% more likely to have had their blood pressure checked in the pre- but not in the post-implementation time period than to have had their blood pressure not monitored in the pre- but monitored regularly in the post-implementation time period ($p<0.05$). The measures for blood pressure control showed significant improvement, pre- to post-implementation. Among those who experienced a change in blood pressure control, patients had almost a three-fold increased likelihood of achieving a mean systolic blood pressure <140 mmHg and a two-fold increased likelihood of achieving a mean diastolic blood pressure <90 mmHg in the post-implementation time period than to have gone from satisfactory to unsatisfactory control in the post-implementation period ($p<0.001$).

No differences were observed between pre- and post-implementation for most of the lifestyle modification

[1] We gratefully acknowledge the contributing work to this report of Anne Martell, Martell Consulting Limited, Ian Deweis, Corporate Research Associates, and Noreen Miller.
[2] For complete methods and results refer to: Graham I. Strengthening Primary Care Initiative: Primary health care practice audits. Diabetes and hypertension. Halifax (NS): Nova Scotia Department of Health; 2004 April.

measures. The only exceptions were for routine assessment of body mass index and exercise counselling. Among charts where a change was observed, patients had almost an eight-fold increased likelihood of having a BMI recorded in their chart in the post- compared to the pre-implementation time period than to have had a BMI recorded in the pre- but not in the post-implementation time period ($p<0.001$). Among patients where a difference was observed in exercise counselling status, patients were 2.5 times more likely to be counselled by a provider about exercise in the post- compared to the pre-implementation time period than to be counselled in the pre- but not in the post-implementation time period ($p<0.001$).

Both of the investigation measures audited showed positive change in the post-implementation time period. Among patients where a change was observed, patients with hypertension were six times more likely to have had a fasting blood glucose recorded ($p<0.001$) and 1.5 times more likely to have had a lipid profile done in the post- compared to the pre-implementation time period than to have had these tests completed in the pre- but not in the post-implementation time period ($p<0.01$).

Discussion

Of the six goals of the Strengthening Primary Care Initiative, three were directly applicable to the chart audit: to improve patient-centred care, to increase health promotion and illness prevention and to improve accountability. The results of this study show that the primary health care organizations involved in the SPCI had a positive impact on these three goals.

The overall patient care related to diabetes and hypertension was either maintained or improved over the course of the Initiative. More patients with diabetes achieved target blood pressure control, and had annual screening for retinopathy and/or nephropathy than prior to the Initiative. More patients with hypertension achieved target systolic and diastolic blood pressures, had their BMI assessed, were advised to participate in moderate exercise, or had a fasting blood glucose level and/or lipid profile done than prior to the Initiative. However, using our study guideline, improvement is needed in frequency of monitoring blood pressure, as patients were less likely to have their blood pressure recorded in the post-implementation time period.

It may be that some of the improvement observed in the post-implementation time period is related to improved clarity and legibility of documentation as a result of charting electronically rather than an actual improvement in patient care. It may have been easier for the chart auditor to abstract data from the electronic patient record than the paper chart. If the quality of primary health care is to be improved, we must be able to accurately measure these indicators. Thus, even if care was not improved dramatically, but rather the recording was better, then the project was successful in meeting the goal of improved accountability by better measurement of the process and outcomes of care.

Alternatively, some of the improvements noted may be an effect of changes in practice patterns over time. Some of the change may be attributed to study effect, increased provider attentiveness from being involved in an evaluation project. Or the changes may be due to influences from other sources during the study period. For example, new guidelines for the care of patients with hypertension were introduced in December 1999.

There were a number of limitations to this study. The chart auditor did not have a clinical background so may have missed some relevant data. Missing or incorrect data may be a result of chart auditor error due to a lack of clinical background when making decisions regarding chart information. Incomplete documentation can also be a problem when using the chart audit method. Reports may be missing, providers may not have elicited specific information, or the clinical practice, even though performed, may not be charted.

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Strengthening Primary Care: Summary of Evaluation Results

Database Extract: Summary Report

September 2004

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Background

The ability to extract data from information systems at the four demonstration sites participating in the Strengthening Primary Care in Nova Scotia project permitted the investigation of research queries concerning practice and clinical management. Comprehensive clinical information, provider appointment and scheduling information were extracted from the information system databases. Data from the electronic scheduler were used to answer such questions as the proportion of providers time spent in clinical, enhanced access, coordination of care, collaborative practice, professional development, project and quality assurance activities. Percentage of providers' time spent in billable and non-billable activities was also determined. The electronic patient records provided the data to determine provider compliance with guidelines for the therapeutic management of three selected conditions: acute otitis media in children (10 years of age and younger), osteoarthritis and a topical inflammatory condition with corticosteroids for patients 65 years of age and older.

Methods

Three of the sites involved in the Strengthening Primary Care Initiative (SPCI) were in rural locations with the fourth site in an inner city community health centre. All patients who visited the four demonstration sites between July 1, 2000 and December 31, 2002 were eligible for inclusion in the electronic database. All appointment and scheduling information pertaining to 22,808 patients was included in the practice management data extraction. Only clinical information for patients (n=4899) who consented to participate in the electronic database method was included in the clinical data extraction. Information system data extracts were downloaded at the four demonstration sites during January and February 2003.

Provider appointment procedure codes were grouped at each site according to previously selected categories. These categories included clinical activities, enhanced access, coordination of care, collaborative practice, projects, professional development, quality assurance and personal time. Personal time was not used in these analyses. Provider procedure codes were also used to determine billable (e.g. patient appointments), patient-related non-billable activities (e.g. coordination of care,

collaborative practice, telephone calls to patients, charting etc.) and other non-billable activities (project work, professional development and quality assurance activities).

The categories for management of acute otitis media in children were based on the therapeutic approaches recommended by the Canadian Pharmacists Association.i The treatment approaches for a new infection of acute otitis media include the initial prescribing of acetaminophen only, followed if required by the addition of a first line antibiotic and where indicated the use of a second line agent. The treatment of a recurrent infection follows a similar approach with the addition of third line therapy and if necessary a fourth line antibiotic agent to resolve the infection.

The 2002 recommendations for management of osteoarthritis by the Academic Detailing Service at Dalhousie University were used to define categories for osteoarthritis prescribing.ii According to these recommendations, prescribing acetaminophen only is the preferred first line therapy for osteoarthritis. Second line therapy consists of prescribing a non-steroidal anti-inflammatory drug (NSAID) with or without acetaminophen, and third line therapy for those patients at high risk for a gastrointestinal event calls for prescribing COX-2 inhibitors with/or without acetaminophen.

The potency categories for topical corticosteroids used in the Nova Scotia Pharmacare Programs were utilized in this study. The potency categories range from least, moderate, potent to very potent.

Descriptive analyses included frequencies and proportions. Associations were explored using the Pearson's chi-squared or Fishers Exact tests. The significance level was set at $p<0.05$. Stata SE 8.0 computer program was employed for all statistical analyses.iii

For complete methods and results refer to the data source.

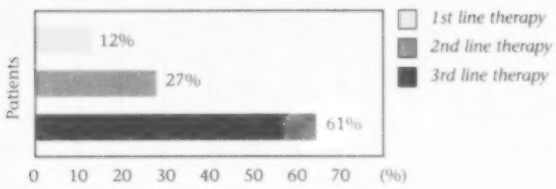
Results

Electronic Scheduler: Based only on work-related scheduling with designated procedure codes (6.1% of appointments did not have a procedure code identified), the majority of providers' time was spent on patient-related activities with on-site clinical activities taking 61.3% and off-site enhanced access 15.2% of providers' time. Coordination of care required 1.6% of providers' time and collaborative practice activities 2.5%. The rest was spent on project-related work (7.9%), professional development (4.5%) and quality assurance activities (7.0%). The proportion of providers' time spent in each of these categories varied by provider group and site ($p=0.000$). Among the professional groups, physicians spent more time giving on-site clinical care and off-site patient-related care (enhanced access) compared to nurse practitioners (NP) and other health professionals. Much of the enhanced access for physicians (37.7%) was a result of care provided in an outpatient department at one site. NPs spent more time preparing and delivering outreach activities, 9.0% compared to <1.0% for physicians and the other health professional group ($p=0.000$).

Overall 64.9% of NP and physician time was spent in billable, 19.8% in patient-related non-billable and 15.3% in other non-billable activities. The proportion of time spent in billable and non-billable activities varied by provider type and site ($p=0.000$). Physicians spent more time performing patient-related billable activities, whereas NPs spent more time performing patient-related non-billable and other non-billable activities.

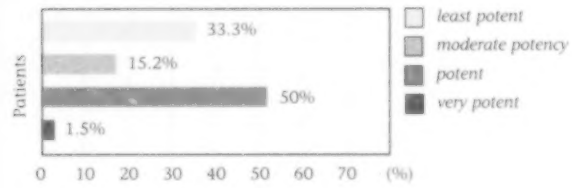
Electronic patient record: From the consenting patient files, 100 patients 65 years of age and older were identified with a diagnosis of osteoarthritis. There were 186 prescriptions identified as potential treatment for osteoarthritis. The majority of prescriptions (86.0%) was prescribed by physicians. There was no difference in the frequency of prescribing of COX-2 inhibitors by provider type or site. Several patients were prescribed more than one therapy during the project time period. Therapeutic management of osteoarthritis by patient is outlined in Figure 1.

Figure 1:
Osteoarthritis management in SPCI seniors (n=100)



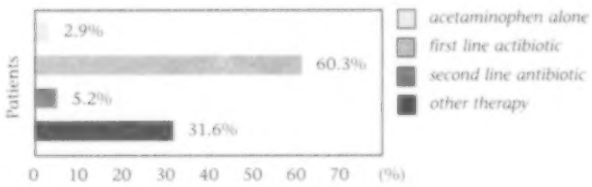
Among consenting patients 65 years of age and older, 66 were prescribed topical corticosteroids. There were 221 prescriptions for topical corticosteroids identified for this group. The majority of these prescriptions (86.0%) was prescribed by physicians. There was no difference in prescribing potency for corticosteroids by provider type; however, a site difference was observed. 88.9% of the potent and very potent corticosteroids prescriptions were prescribed at one site (p=0.000). Figure 2 describes the management of dermatologic conditions using topical steroids by patient during the course of
the project.

Figure 2:
Management of dermatologic conditions in SPCI seniors using topical corticosteroids (n=66)



Among consenting patients 10 years of age and younger, 102 were diagnosed with acute otitis media (AOM). There were 205 visits identified for the management of AOM with 49 children having more than one visit for treatment of AOM. Among children with more than one visit for AOM, 31 visits were deemed to be for a recurrent infection. Nurse practitioners did most of the prescribing (72%) for acute otitis media cases in children. For new infections of AOM, there was no significant difference in prescribing practice by provider type; however, there was a site difference (p=0.000). Figure 3 shows the percentage of visits for new infections by prescribing practice. The majority of other therapy is for prescriptions for second, third and fourth line antibiotics recommended for recurrent infections only.

Figure 3:
Management of new episodes of acute otitis media in SPCI children < 10 years of age (n=174 visits)



There was no provider difference observed in prescribing for recurrent infections of AOM, possibly due to small sample size. Acetaminophen only was prescribed for 6.5% of children 10 years of age and younger diagnosed with a recurrent episode of AOM, first line antibiotics for 32.3%, second line for 25.8%, third line for 6.5% and fourth line for 29%.

Conclusion

Data extracted during this project included patient information related to: medications prescribed, chief complaints, symptoms, allergies, diseases, surgical procedures performed, vital signs, counseling and recommendation provided, diagnostic tests ordered, referrals, smoking status, diet and exercise. Previously these types of information were only available through the timely process of manual chart audits or self-reported in costly patient surveys. As a result of the data extractions a number of important clinical management questions were answered. In addition, data from the practice management component provided the SPCI with comprehensive provider appointment and scheduling information. The capacity to obtain such comprehensive information was not previously available and now provides an additional tool for evaluation and decision-making.

In addition, the clinical data has not been validated.

Data Source

Graham L. Strengthening Primary Care Initiative: Database extract report. Halifax (NS): Nova Scotia Department of Health: 2004 March.

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